MAY 16 1938

May 16, 1938

# STEEL

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# Comments

***Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.***

## Sulphurous Error

*To the Editor:*

I was interested in Mr. H. A. Newbury's letter in Reader Comments, STEEL, May 2, concerning the iron found in the cinder dump at Arden, N. Y., but somewhat alarmed at an iron of .18 per cent sulphur being considered "pretty good."

Several possible explanations suggest themselves. Maybe the analysis was the reason the iron was in the dump, someone may have forgotten the limestone. Possibly STEEL's proofreaders were at fault, it is unusual for sulphur to go so far "off" with hot iron (3.50 Si.).

I can only suggest that if I were assigned to a crew operating a Parrott gun which showed .18 sulphur I would consider it to be ample excuse for desertion.

L. F. HERRON

*James H. Herron Co.,*
*Cleveland.*

---

EDITORS' NOTE—Mr. Herron's second guess is correct. The high sulphur figure resulted from a proofreader's error, omitting the cipher following the decimal point. Mr. Newbury's analysis showed a sulphur 0.018, which is a low figure.

## Annual Wage Is Studied

*To the Editor:*

A highly interesting question has been raised in the suggestion that an annual wage be provided for steady workers in industry, instead of the hourly rate now in vogue. This would stabilize earnings and give greater security and opportunity to budget and plan expenditures which the fluctuating earnings of the present forbid.

Our company and many others are studying the possibilities of this plan and its advantages. However, the entire question is hedged about with so many uncertainties and studies are in such an incomplete stage that it is difficult to state anything definite.

One company is known to have introduced such a plan which is working well for the worker and the employer and this is being studied to find how it can be applied in different situations.

That such a request has come from the workers indicates a thinking attitude which employers are anxious to foster and probably some basis will be found for applying this principle in some degree. Our company will be pleased to know what progress others are making in finding a solution.

EMPLOYER

*Chicago.*

## America Builds World's Mills

*To the Editor:*

When the world wants more and better blast furnaces and steelmaking plants it turns to the United States for its engineers. It would seem from the present situation that the most efficient designers and builders are in this country and even Great Britain and Germany acknowledge this by hiring American engineers for building their important works.

In STEEL, May 9, it was interesting to read of the number of projects over the world now in the hands of our builders. Yet the mills noted in this article did not cover the entire situation. The greatest steelworks in the U.S.S.R. were built by Americans, sheet mills for Australia were built in Pittsburgh and shipped half round the world. Recent articles in STEEL have told how an American engineer developed the great Tata works in India and another American operated them until it was possible for the Indian personnel to carry on.

Along this same line the heavy exports of machine tools indicate the superiority they hold over products of other countries. American manufacturers have been called poor merchandisers, in comparison with some European exporters. If this be true their products must sell themselves, for American tools are in demand the world over, in competition with the best of other countries. In fact, they are bought by Germany and Great Britain, who compete in world markets with the American product.

ENGINEER

*Youngstown, O.*

## Steel Aids Railroads

*To the Editor:*

Development of special steels which brought the automobile and automotive truck as competitors of the railroad and in some important measure cut into its revenues is now supplying the remedy in lighter, stronger and faster trains by which some of the lost traffic may be regained.

New fleets of streamlined trains going into service in June on the New York Central and Pennsylvania will win back at least some of the lost business and the lighter freight cars which reduce dead weight are helping economy of operation. Thus steel serves both ways.

SHIPPER

*Cleveland.*

## STEEL a Real Necessity

*To the Editor:*

Please renew our subscription to STEEL to continue until July, 1940, giving us 104 additional issues. We couldn't get along without it.

S. R. ROBINSON

*Vice President,*
*Ft. Dodge Iron & Metal Co.,*
*Ft. Dodge, Iowa.*

*Section of creep rack showing devices for measuring elongation.*

# Research and ST. JOE CHEMICAL LEAD

IN 1870 St. Joe Chemical Lead was famous throughout the United States for its acid resisting qualities. Nobody knew why. The chemical companies just knew that if they specified St. Joe Chemical sheet lead for their acid tanks that it lasted for ten, twenty, thirty years—often many times as long as any other grade of lead. St. Joe lead was named Chemical Lead, not by the St. Joseph Lead Company, but by the consuming trade. It was imitated by other producers in the United States and other countries.

WITHIN the last decade, this Company established its modern research laboratory at Bonne Terre. Efforts were made to determine exactly why the lead made from Missouri ores, containing copper, nickel, and no bismuth, was superior, and whether its properties could be further improved. Hundreds of tests were run. Lead was made with varying percentages of copper, nickel, silver, calcium, selenium, bismuth, cobalt, cadmium, antimony and other elements. Tests were conducted for hardness, creep, tensile strength, fatigue and corrosion resistance in varying strengths and temperatures of acids. The result: 1.—Most of the leads and lead alloys tested have good resistance to corrosion in $H_2SO_4$. 2.—St. Joe Chemical Lead combines a lower creep rate and greater corrosion resistance than any other brand of lead or known lead alloy. Thus it was proved that the chemical industry's preference for St. Joe Lead in 1870 was justified, and explains why they still specify it in 1938.

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# STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW


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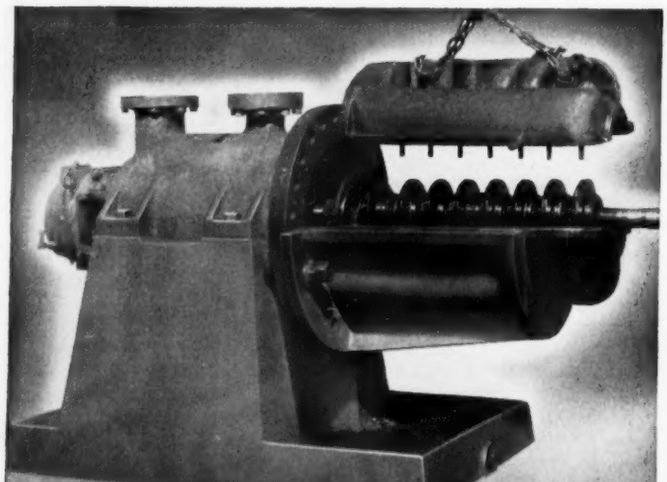
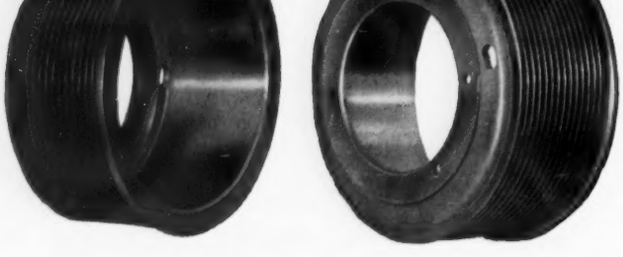
## PUMP CASING RESISTS HARSH ABRASIVES

This pump casing on a dredge in San Diego harbor has handled 3,200,000 cubic yards of material averaging 5% rock, 20% gravel, 10% silt. Owners estimate it good for 1,000,000 yards more. Made by Golden State and Miners Iron Works Co., of alloy cast iron containing 1.50 to 2.00% Nickel and about 0.50% chromium.





## TAKES THE BRUNT OF 16,000 STOPS AT 50 M. P. H.

Research by leading bus and truck manufacturers proves 2% to 2½% Nickel-chromium cast iron the ideal brake drum material for high-speed, heavy-duty vehicles. In severe tests simulating road braking conditions, with 200 stops at 80 m.p.h. and 16,000 stops at 50 m.p.h., wear on the drum was only 0.002, with no scoring despite temperatures over 800 deg. F.

## WITHSTANDS CORROSION FROM CRUDES

For nine months this pump has continuously discharged Gulf Coast crude, with a specific gravity of 76 at 750 deg. F., 1100 p.s.i. Says the manufacturer, Byron Jackson Co., Los Angeles, "The entire output of the plant has been handled by this pump, and undoubtedly a great deal of coke and sediment has passed through this unit, yet the Nickel cast iron inner case shows no noticeable effects of either corrosion or erosion."

Additions of small amounts of Nickel render cast iron uniformly hard, tough and wear resisting, yet capable of being machined and ground to a smooth, glossy finish. Consultation on problems involving the use of Nickel cast irons and other Nickel alloys is invited.

**THE INTERNATIONAL NICKEL COMPANY, INC., NEW YORK, N. Y.**

# As the Editor Views the News

■ MUCH of the striking news of the past week developed in the labor bracket. When the national labor relations board announced it would vacate its order of April 5 directing Inland Steel Co. to sign a contract with CIO as sole bargaining agent, it stated that "further proceedings" were the purpose. Inland countered by asking (p. 28) by what legal right the board could vacate its orders. The company holds that if the board has the right to set aside the order it has no power to hold any further proceedings in the case . . . Some 40,000 letters have been sent to employers and employes (p. 40) asking suggested changes in the national labor relations act. Replies ask that employe responsibility be fixed and that the labor relations board be prevented from acting both as prosecutor and judge.

• • •

**Hook Urges Tax Study**

As president of the National Association of Manufacturers, Charles R. Hook (p. 40) has asked congress to appoint a nonpartisan commission to examine the national tax structure and recommend simplification and improvement. Mr. Hook described the current tax bill as a real step forward . . . At Detroit, automotive workers who look forward to slim earnings in the summer months have transformed vacant lots throughout the city (p. 35) into well cultivated farm plots. Current estimates are that production of 1939 models will be much below that of 1936 and 1937 models. Chrysler Corp.'s inventory declined more than 20 per cent during first quarter . . . New Cartwright bill, passed by the house, provides for federal highway spending (p. 40) of $238,000,000 in each of the fiscal years of 1940 and 1941.

• • •

**Easy Machining**

Sitdown strikes are illegal in Illinois (p. 28) and two CIO organizers and 37 sitdown strikers must pay fines and serve jail terms . . . A new open-hearth steel (p. 29) is said to machine as freely as bessemer steel without sacrifice in physical character. It conforms in analysis to SAE 1115 steel, with the addition of a small percentage of lead . . . Trend toward complete electrification of many machines about which there was some question two years ago now (p. 28) is definite. Many things formerly "built on" now are being "built in" . . . Industrial leaders have made great progress in adapting their business policies to conditions resulting from enactment of new legislation in the last few years it was revealed (p. 25) at the triple mill supply convention at Pittsburgh last week.

• • •

**Cold Forging**

Long used in production of rivets and bolts the cold forging process has made great progress in the past five years due to radical improvements in equipment. Using wire, rods and bars as raw material, the cold forging process (p. 44) now is used in the production of thousands of products, within close tolerances. . . . Data are presented (p. 48) on the number and type of brick required for making correctly designed refractory arches of different types that will have maximum service life. . . . Increased cost of machinery and higher labor costs of late have forced the development of more efficient machining methods. Most essential element in the operation of machine tools (p. 58) is the use of the right tools, improvements in tooling have been developing with great rapidity.

• • •

**Improved Rivet**

A new rivet (p. 78) is proving useful in applications where space is confined and materials are fragile or where heating, hammering or upsetting are impractical. . . . Continuous butt welded tubing made from flat rolled steel is given a normalizing treatment (p. 68) which completely recrystallizes the steel so that the joint is not shown by micrographs through the section. . . . An all welded truss of new design permits advantageous utilization of space above the bottom chord for a materials handling system. . . . Several unusual features are incorporated (p. 61) in a materials handling system in a steel mill for handling sheets in connection with batch pickling and scrubbing. . . . Mileage of 120 per gallon of gasoline is claimed for a new motor driven scooter (p. 78) with speed ranges up to 35 miles per hour.

E. L. Shaner

# *Weather is not such a problem*
## when you're prepared for it

## INLAND COPPER-ALLOY SHEETS
## last 4 to 5 times as long even under most severe weathering

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# Germany Forging Ahead with 4-Year Plan

# In European Strategy of Steel

■ GERMANY, for the past five years the world's second largest steel producing country, is seeking to strengthen its position in this respect by additions to steelmaking facilities and by more intensive development of natural resources. Austria, now a part of Germany, is playing an important part in this program.

While these moves are in the direction of self-sufficiency in the matter of raw materials for the German steel industry, attainment of that goal has not been made a fetish, nor is it the primary consideration. For one thing it might not be economically desirable—except in time of war—for Germany to be entirely independent of foreign sources of iron ore.

Germany has been bending its efforts toward the development of materials that may be substituted for commodities now imported. Conservation of waste products is emphasized. Increased output of products that can be exported, such as steel, is being encouraged. None too robust financially, Germany hopes to bolster its strength through the establishment of a better balance between imports and exports.

### Eyes War Possibilities

Also, like any other European nation, Germany must keep one eye cocked in the direction of the odds on war possibilities. As the backbone of armaments, iron and steel producing facilities naturally would be expected to receive close attention from any nation whose likelihood of becoming embroiled in eventual conflict is as great as Germany's.

Germany has been handicapped by an inadequate supply of domestic iron ore, a situation created largely by the loss to France in 1919 of the rich Lorraine deposits. In the last pre-war year, Germany mined about 36,000,000 tons. In 1937, while production of iron and steel reached new high levels, the tonnage of iron ore mined, lacking the Lorraine output, was less than 9,000,000 tons. This makes it necessary to import about 20,000,000 tons annually, based on the present rate of consumption.

To add to Germany's difficulty in obtaining enough ore, the Spanish civil war shut off importations from that country, while active world-wide demand during the past year made smaller quantities than usual available from other sources of supply. Sweden is an important exporter of iron ore, and it is thought by some observers that Germany will continue to be a customer of that country because the latter provides a market for German coal.

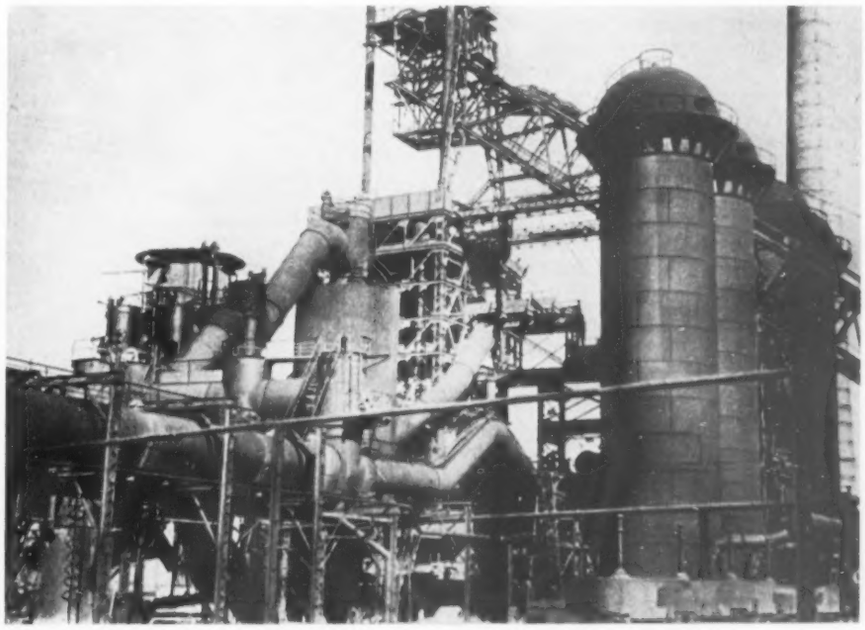
### Economic Advantage

This reciprocal trading, it is pointed out, has an economic advantage to Germany which would possibly outweigh that to be derived from more complete dependence upon the lower-grade domestic ore.

As announced last year, Germany has turned to the active development of its own ore properties. These ores are lean, averaging between 23 and 25 per cent iron, and require beneficiation before they can be employed efficiently in the blast furnace.

In order to make effective use of these ores, new plants employing a special process are being built. The program, termed a Four-Year Plan, includes three steelworks and 32 blast furnaces, contracts for the building of which went to H. A. Brassert & Co., Chicago. This company also built the Corby iron and steel plant in England where a similar process is employed.

It had been implied that this construction would proceed promptly, but actually only one plant is under way. This is the largest unit, the Salzgitter plant near Brunswick, located at the Salzgitter ore beds of



■ **Blast furnace No. 4 of the Czechoslovakia Mining & Iron Works Co., Praha, located at Trinec. This is a unit in the Czech iron and steel industry, which last year produced 2,290,000 gross tons of steel ingots and castings. This is more than three times the 625,000 tons made by Austrian steelworks in 1937, both these figures representing practical capacity. Czechoslovakia produced 1,660,000 gross tons of pig iron to Austria's 320,000 tons last year**

northern Germany. This project includes eight blast furnaces. It is officially said to be a matter of conjecture when, if and how many of the remaining 24 stacks will be built—although equipment builders in this country recently have been asked to submit figures. Similarly, the go-ahead has yet to be given on the construction of the two smaller steelworks in Bavaria and Baden.

A recent addition to the Four-Year Plan, however, is the proposal to build a new steel plant at Linz, located in the northern part of newly-acquired Austria. Austria has little steel producing capacity—its 1937 production set a post-war record of 650,000 tons—but it has iron ore resources estimated at about 200,000,000 tons, averaging about 30 per cent iron. Consequently, the country becomes useful to Germany at a convenient time, insofar as development of the latter's steel industry is concerned.

**Details Unavailable**

The Linz plant will have an annual capacity of 1,000,000 tons of ingots, it is understood, but specific details regarding its producing facilities are not available at this time. Location of the works is intended to take advantage of coal and ore supplies. Ore will come from Styria, south of Linz, while water transportation is available for the movement of coal from the Ruhr up the Rhine, via canal to the Danube and thence to the new plant.

With the completion of the Salzgitter and Linz plants, Germany will have added considerably to its steelmaking capacity and to its general economic stature among world powers. Opening of the Salzgitter ore deposits is to be pushed, and production this year is expected to be considerably heavier than in 1937. Steel ingot production, unlike the trend in the United States, has been well maintained so far this year and for the first time in history has exceeded the United States output.

Monthly average production of steel ingots and castings in Germany last year was 1,654,000 tons, compared with 4,192,000 tons in the United States. The comparison of pig iron and ferroalloy output for the two countries was 1,258,000 and 3,100,000 tons.

While operations here dropped sharply after September, reaching a low in December of 1,472,241 tons of ingots, German activity has increased. Production in Germany was 1,783,900 tons in January and 1,742,500 in February, while the United States turned out 1,732,266 and 1,703,245 tons, respectively, in the two months.

Germany's position with respect to other leading European countries in steel production may be gathered from the following figures covering 1937 output:

| | Gross Tons |
|---|---|
| Germany | 19,380,000 |
| Russia | 17,000,000 |
| Great Britain | 12,900,000 |
| France | 7,825,000 |

Pig iron production for the same countries last year follows:

| | Gross Tons |
|---|---|
| Germany | 15,700,000 |
| Russia | 14,300,000 |
| Great Britain | 8,500,000 |
| France | 7,825,000 |

**CENTRAL EUROPEAN STEEL GROUP INSPECTING PLANTS**

■ A group of European steelmakers headed by A. T. Kathner, consulting engineer, of Siegen, Germany, and Pittsburgh, is making an extensive inspection tour of American iron and steel plants. The party includes Emil Verbach, manager, Prager Eisen Co., Kladne, Czechoslovakia; Hermann Buch, chief engineer, Siemag, Siegen; Heinz Humann, superintendent, Dillinger Steel Works, Dillinger-Saar, Germany; and Erwin Gerlach, superintendent, Sheet Mills Huta Batory, Poland.

Starting in Detroit May 2, the party has visited Chicago, Middletown, Canton, and Youngstown. They will arrive in Pittsburgh Tuesday, May 17, and remain there through the week concluding their tour.

## Proposes $100,000,000 To Buy Strategic Materials

■ A bill providing for purchase of raw materials, concentrates and alloys essential to industry for manufacture of supplies for army forces and civilians in time of national emergency was introduced late last week by Senator Thomas, Utah.

Bill was drawn by government experts at the request of Senator Thomas, chairman of the senate subcommittee on military affairs, and who has been in charge of the recent hearings.

The new bill provides $100,000,000, $25,000,000 a year for four years for purchase of strategic materials. It displaces the Miller manganese bill on which government experts could not agree.

## Shows Alloy Steel In Technicolor Film

■ An interesting insight into production and use of alloy steel was furnished recently by the Ludlum Steel Co., Watervliet, N. Y., at a preview of its technicolor motion picture at the Museum of Science and Industry, New York.

The film requires more than an hour to run. The application of the company's latest product, "Ludlite", a light gage stainless steel, for numerous purposes, is featured.

## 500-Ton Press Built for Russia

■ **Soviet airplane parts, it is reported, will be formed at a rate of two a minute on this 500-ton hydraulic press built by Lake Erie Engineering Corp., Buffalo. More than 75 tons of pig iron made by Republic Steel Corp. were used in the cast iron parts of the 30-foot high unit. Soviet government has purchased six of these presses, has options for more**

# Stress Need of "Human Engineer" At Triple Mill Supply Convention

■ MILL supply manufacturers and distributors have made great progress in adapting their business policies to conditions that have resulted from enactment of new laws during the past few years, it was revealed at the triple mill supply convention at Pittsburgh, May 9-11.

Participating were the Southern Supply and Machinery Distributors' association, the National Supply and Machinery Distributors' association, and the American Supply and Machinery Manufacturers' association.

The current business recession received little attention and the prevailing note coincided with the views expressed by J. L. Perry, president, Carnegie-Illinois Steel Corp., who addressed the three associations at a joint luncheon. He stated that industrial executives are faced with many difficult problems and that new problems are likely to confront them in the future. But he expressed an abiding faith in the future of this country and in the ability of its people to work out of their difficulties.

As to the near future of the steel industry, Mr. Perry reminded his hearers that steel production currently is at about one-third of capacity. He thought the chances are that the rate soon will move up from that level.

In his presidential address before the American association, Roger Tewksbury, Oster Mfg. Co., Cleveland, stressed the importance of training junior executives so they later will be able to shoulder the increasingly complex responsibilities of management. A successful industrial executive today, he said, must be part lawyer, part certified public accountant, part tax expert, part labor relations and part public relations man.

### Should Negotiate Collectively

Discussing the successful conduct of labor relations, J. H. Goss, vice president, Scovill Mfg. Co., Waterbury, Conn., stressed the need for a new type of expert—the human engineer, expert in understanding and controlling human emotions. He described the benefits that come from the application of such specialized ability.

"While wage earners have many desires, only two are fundamental," said Mr. Goss. "One of these is for as much compensation as he or she can get. The other is the privilege of meeting, without embarrassment and on an equal plane, with the top executive of the company. When these primary desires are gratified the others present little difficulty.

"The men are fond of playing jokes on each other and those who are deficient in a sense of humor become the targets of others. This same disposition is reflected when they meet the boss. They are eager to see what the old man will say and how he will act. They are curious to find out if he 'can take it.'

"A great deal of patience and self-control as well as a sense of humor are required if the boss is to sell himself to his men. They know very well that the right to collective bargaining—I prefer to call it collective negotiation—is guaranteed to them under the law. An executive cannot afford to lose his temper, be abrupt or say 'no' without due consideration.

### Keep Record of Conferences

"If the top executive does not have the requisite qualifications, the job of dealing with employes must be delegated to an executive adequately equipped. If a company has no executive so equipped it is just too bad.

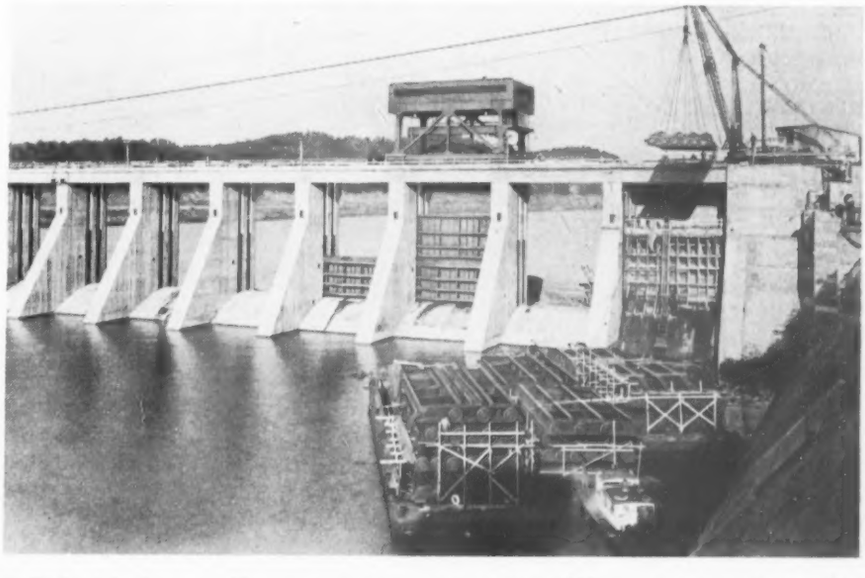
"It is advisable to have a stenographer on hand at all conferences with employes. A complete record of the proceedings at such meetings proves an aid in preserving stable labor relations. Never bargain with one man; bargain with them collectively."

Despite current problems, it is industry's job to sell more of its products, said Col. Willard T. Chevalier, vice president, McGraw-Hill Publishing Co., New York. The need is for mass distribution methods to parallel our mass production. He had little sympathy for complaints that the cost of distribution is too high. The need is for more effective selling which, by increasing volume, will bring down the total cost of doing business. He urged intelligent study of markets and sales facilities and the use of advertising.

"Despite the depression distributors have not yet learned how to operate efficiently," said Robert S. Page, Henry Walke Co., Norfolk, Va., president of the Southern association. "Distributors generally took losses over the first four months of this year."

C. F. Conner, B. F. Goodrich Co., Akron, O., submitted results of a study of the use of manufacturers' sales literature in increasing distributors' volume and profits. Properly planned, prepared and distributed, such literature assists the distributors materially. He mentioned many factors that require

## 2400 Tons of Steel in Pickwick Dam Gates



■ **Pickwick dam on Tennessee river, part of the TVA project, required more than 2400 tons of steel for spillway gates alone. The 23 gates were fabricated in two sections by Dravo Corp., Pittsburgh, and delivered to the dam site by barge. Lower sections are 41 feet wide, more than 20 feet high, weigh 65 tons each. Heavy fabricated silicon steel girders and diaphragms compose the framework to which is welded a ½-inch steel skin-plate. Top sections are approximately the same dimensions but weigh only 40 tons**

careful attention. For example, mailing lists become liabilities instead of assets if not continuously corrected. Mr. Conner's paper, which is to be printed by the American association, covered such matters as the allowable cost of such literature, who should be responsible for it, and other details. He stressed the importance of planning the literature in advance. It is advisable to plan it as much as a year ahead.

The part of the sales manager in efficient merchandising was the subject of discussion by W. C. Hunter, Ross-Willoughby Co., Columbus, O., N. J. C. Lester, C. M. McClung & Co. Inc., Knoxville, Tenn., and W. A. Purtell, Holo-Krome Corp., and Billings & Spencer Co., Hartford, Conn. Studies of sales potentials by individual companies and industry groups, it was shown, point the way to increased sales and profits.

There are two phases of customer approach, the analytical and the physical, said Mr. Purtell. Too many salesmen call on companies that they cannot hope to sell. If salesmen and sales managers plan carefully they will concentrate on prospects who are or could be developed into customers. No salesman should call on a prospect unless he first has acquainted himself with the nature of the prospect's business and requirements and thus has a good idea as to what he can expect to sell him.

Although resale price setting by manufacturers is legalized in 43 states by the Miller-Tydings act, few manufacturers so far have taken advantage of the provisions of this act. Court decisions have sustained several of its provisions, including the one stipulating that a contract made with one distributor in a state holds for all distributors in that state, according to George A. Fernley, advisory secretary of the National association.

### Advises Distributor Protection

He advised distributors to urge manufacturers to establish fair trade contracts for protection of distributors against price cutting. Under the law, he said, a distributor may sue anyone who sells at cut prices for an amount equal to the losses caused by such price cutting.

F. W. Copeland, H. Channon Co., Chicago, outlined a method of determining monthly profit and loss by departments. The system enables the management to exercise better control of the business by revealing which departments are doing well and which are lagging. The system also is used as the basis for adjusting pay to employes.

Ray C. Neal, R. C. Neal Co. Inc., Buffalo, described the bonus system which this company has operated successfully for a number of years. All employes have minimum salaries based on the cost of living. In addition all receive bonuses. A salesman gets 10 per cent on increases in sales over the previous quarter, 1 to 5 per cent on increased sales of certain lines, and an additional bonus when he sells as much in one quarter as in the entire preceding year.

The inside men receive a bonus related to the salesmen's bonuses, thus making for co-operation. In addition, all employes receive a bonus based on the company's profit. The bonuses to salesmen are figured on the basis of net over cost, so that a salesman can earn a bonus merely by reducing his cost.

### Stick to Policies

Manufacturers should bear in mind that all business must show a profit, said H. F. Seymour, Columbian Vise & Mfg. Co., Cleveland. They should have good distributor policies and stick to them. They should follow a long-pull policy rather than one of temporary advantage. Not enough manufacturers are firm in insisting on maintenance of resale prices. He reminded his hearers that they legally can stop violations of resale price agreements.

Distributors should be encouraged not to undertake a bigger job than they can accomplish, said Mr. Seymour. One distributor recently cut its sales prospect list by some 25 per cent. Since concentrating on the remaining 75 per cent it has increased its volume by 13 per cent. Recently a distributor made a check of a list of about 1100 possible customers for a certain line. It found that 85 per cent of its sales were made to less than 200 companies on this list. It now is concentrating on these 200 companies in the hope that more business can be developed from them.

C. E. Lilley, Superior-Sterling Co., Bluefield, W. Va., said the wise distributor favors the manufacturer who has a published policy and adheres to it and who insists on maintenance of the resale price. The distributor has nothing to gain from pushing the products of manufacturers who sell indiscriminately to all classes of buyers and who have a wide open price policy. He advocated friendly relations between competitors, saying that such cultivation is a great aid in preventing unethical selling.

The committee on sales territory agreements for distributors is making a study of the controversial term "selective distribution," and hopes to formulate a definition for it in the near future, said H. C. Clark, Norton Co., Worcester, Mass.

Advertising in business, industrial, technical and trade papers is of great value, said W. E. McFee, American Rolling Mill Co., Middletown, O. To be effective it must be backed up by good sales and distribution organizations. Much money is wasted on advertising because a great many companies do not know how to advertise. Media must be picked with care, and after thorough study of their circulation and understanding of their editorial appeal.

Once a company begins to advertise it must continue to advertise as long as it remains in business. He cited various products famous in other years and now dead because their manufacturers decided they were too well established to require further advertising. Rewards of advertising go to the companies that advertise boldly and skillfully.

J. J. Welch, editor, *Mill Supplies*, reviewed results of an extensive survey on the subject of distributor sales meetings. Such meetings are valuable if planned in advance and conducted effectively. He presented an extensive "do" and "don't" list for the guidance of manufacturers in their effort to arouse enthusiasm for their products on the part of distributor salesmen.

Distributor sales records should be as simple as possible, said G. Cheston Carey, Carey Machinery & Supply Co., Baltimore. His company uses records that bear the territory number, the industry code number, the line code, number of sales in the previous year, sales by quarters, calls by salesman during the previous two years, also space for names of officials of the customer company. Three copies are made, one for the salesman, one for the office and one for the mailing list department. These simple records are entirely adequate.

### Purchasing Agent Viewpoints

What the purchasing agent expects from the distributor was the subject of an interesting talk by R. D. King, purchasing agent, Koppers Co., Pittsburgh. The price quoted by the distributor should not be higher than the price quoted by the manufacturer. The distributor should study the customer's problems, should have good warehouse facilities, should buy from good manufacturers, should keep his catalog up-to-date, should not only have good credit himself but should extend credit to reliable customers, should have adequately trained salesmen, should have one price and should not make substitutions without the customer's approval.

In speaking on the subject of keeping salesmen on their toes, S. D.

Conant, Sligo Iron Store Co., St. Louis, said it is better for a distributor to train his own salesmen rather than draw them away from other distributors.

A. J. Sparks, F. Raniville Co., Grand Rapids, Mich., spoke on the selection of lines that can be sold profitably. The study must cover user benefits of the product, margin of profit, anticipated volume, how much stock will be required, prestige of the product, merits of the product, the kind of co-operation extended by the manufacturer and the manufacturer's terms.

High lights of the convention were four dramatic skits revealing unsound practices and theories that come under the heads of selective distribution, resale price schedules, sales promotion and reciprocity. The scripts were prepared by F. W. Copeland, H. Channon Co., Chicago; Alvin M. Smith, Smith-Courtney Co., Richmond, Va.; H. C. Clark, Norton Co., Worcester, Mass.; and H. H. Kuhn, Hardware & Supply Co., Akron, O. Parts were acted by members of the three associations.

### Says Business on Upturn

A guest speaker was A. A. Berle, assistant secretary of state, Washington, who expressed the opinion that business is on the eve of an upturn. He defended the government spending program.

The size of the public debt should cause no concern, he said, as long as the borrowed money is not wasted. If converted into forms of wealth such as roads, hospitals and dams, the debt is balanced.

Mr. Berle scoffed at charges that the unbalanced budget is the cause of fears that brought the present business depression. Government expenditures in 1936 were far above income and yet this condition did not prevent the wave of confidence which brought a substantial business improvement that year and early in 1937.

He declared that the increasing efficiency of industry is bringing new problems that are difficult to solve. He mentioned the shortage of housing, saying this was due to high costs of building materials and building labor. This problem would yield to solution, he believed, if compensation in the building trades could be placed on a yearly basis instead of by the hour, thus resulting in lower charges to home owners without reducing the total income to those in the building trades.

The issue in this country today is collectivism vs. individualism, said James A. Emery, general counsel, National Association of Manufacturers, Washington. He analyzed various laws and pending bills which, he said, have advanced us far on the road to complete collectivism. He advocated a restoration of the profit motive, saying that it has proved more powerful than any other motive in driving men along paths of progress. The unbalanced budget, he warned, is bound to bring grave consequences if not placed under control in the near future.

Felix H. Levy, Washington, counsel for the American association, expressed confidence that the recent

**W. A. Purtell**
Elected president, American Supply and Machinery Manufacturers' association

stockyards case decision, in throwing out Secretary Wallace's rate fixing ruling on the ground that the marketing agencies affected had not been given a fair hearing, is a forerunner of fairer administration of the national labor relations act.

Next year's convention will be held on a ship at sea. Details will be announced at a later date. The 1940 convention is slated for Dallas.

**American Supply and Machinery Manufacturers' association** elected the following officers: President, W. A. Purtell, Holo-Krome Screw Corp. and Billings & Spencer Co., Hartford, Conn.; first vice president, D. W. Northup, Henry G. Thompson & Son Co., New Haven, Conn.; second vice president, H. K. Clark, Norton Co., Worcester, Mass.; treasurer, Horace Armstrong, Armstrong Bros. Tool Co., Chicago. R. G. Thompson, Lufkin Rule Co., New York, was appointed chairman of the executive committee. New members are: Horace Cunningham, Ames-Baldwin Shovel Co., Boston; A. A. Murphy, Cleveland File Co., Cleveland; Richard D. Baker, Pittsburgh Screw & Bolt Corp., Pittsburgh.

**National Supply and Machinery Distributors' association** elected the following officers: President, W. T. Ryan, Cutter, Wood & Sanderson Co., Cambridge, Mass.; first vice president, C. E. Curtis, Western Iron Stores Co., Milwaukee; second vice president, A. R. Smith, Boyer-Campbell Co., Detroit. New members of the executive committee are: F. W. Copeland, H. Channon Co., Chicago; Andrew G. Carey, Carey Machinery & Supply Co., Baltimore; P. O. Boylan, W. M. Pattison Supply Co., Cleveland; H. J. Gundlach, Mine & Smelter Supply Co., Denver. George A. Fernley, Philadelphia, continues as advisory secretary and H. R. Rinehart, Philadelphia, as secretary-treasurer.

**Southern Supply and Machinery Distributors' association** elected these officers: President, Jack B. Dale, Briggs-Weaver Machinery Co., Dallas, Tex.; first vice president, Edward F. Stauss, Oliver H. Van Horn Co. Inc., New Orleans; second vice president, J. M. Bates, Moore-Handley Hardware Co., Birmingham, Ala. Alvin M. Smith, Smith-Courtney Co., Richmond, Va., was re-elected secretary-treasurer. Robert S. Page, Henry Walke Co., Norfolk, Va., is chairman of the executive committee, while other new members of this committee are C. E. Lilley, Superior-Sterling Co., Bluefield, W. Va.

## Bethlehem Steel Enters Seamless Pipe Business

■ Bethlehem Steel Co. has entered the seamless tubing business and is ready to supply seamless casing, tubing and line pipe, rounding out its line of products for the oil industry.

The company announces the new seamless products are made under careful supervision and metallurgical inspection and control. Sample strings, both threaded and coupled, and bell and spigot types, have been run in several widely separated fields, under varying conditions, with excellent results.

All standard sizes and types of seamless casing, tubing, and line pipe up to and including 8⅝-inch outside diameter are available. A mill depot has been opened in Houston, Tex., at 7200 Clinton drive, where a complete stock will be maintained. Adequate stock also is maintained at the mill at Beaver Falls, Pa.

Bethlehem will continue to manufacture lapwelded surface casing, from 10¾-inch to 13⅜-inch outside diameter, as well as all sizes of lapwelded line pipe up to and including 16-inch outside diameter. These products also will be stocked at the Houston depot.

All of these products are available through Bethlehem's regular sales organization, as well as through the facilities of its subsidiary, Bethlehem Supply Corp., operating in the Mid-Continent and Gulf coast fields.

# Review Progress At Tool Forum

■ NEARLY 100 engineers, representing leading builders of machine tools and other industrial machinery, spent May 9, 10 and 11 at the East Pittsburgh plant of the Westinghouse Electric & Mfg. Co. During this, the third annual machine tool electrification forum, 16 papers were presented by representatives of the builders and users of electrical drives and controls. There also were several important informal addresses, including those by Howard W. Dunbar, president, and Tell Berna, general manager of the National Machine Tool Builders' association.

Inspection trips to the Nuttall gear works, the newly organized motor manufacturing department, the research laboratories, and the flood control gates and pumping station on Turtle Creek, served to illustrate many of the points which were brought out in the papers.

### Meeting of Minds

When the forum was begun three years ago, the primary object was to bring about a meeting of minds between the electrical and the machinery industries, to the end that safer, more dependable and better looking electrified machinery might be developed. That the end is being achieved is attested by a number of electrical devices which recently have been developed to meet previously expressed needs of machinery builders and users; also by the complete freedom and frankness of discussion throughout the sessions this year.

Speakers representing the machinery industry included: J. E. Doran, sales manager, G. A. Gray Co.; C. W. Heppenstall Jr., Heppenstall Co.; R. S. Elberty, electrical engineer, Landis Tool Co.; W. C. Tucker, assistant chief engineer, machine tool division, Buffalo Forge Co.; A. H. Platt, electrical engineer, Bullard Co.; and H. Earl Morton, president, Morton Mfg. Co.

Representing the Westinghouse company were Bernard Lester, R. S. Kersh, R. W. Owens, T. R. Lawson, W. S. Riser, R. S. Marthens, A. H. Heywood, T. C. Kelley, W. I. Bendz, D. L. Pierce, E. G. Forgy, Dr. L. W. Chubb, C. B. Stainback, C. Anderson, O. G. Rutemiller, W. D. Turnbull, D. B. Charters, and J. E. Webster.

The trend toward complete electrification of many types of machines, about which there was some question two years ago, is definite now, if one can judge by the prevailing spirit of the recent forum. Many things formerly "built on" are now "built in" and as one experienced observer expressed it, "machines are getting a lot better electrically because their electrical equipment is being designed and built a lot better mechanically—largely because mechanical and electrical engineers are now working in such close co-operation."

# LABOR

### NO BACKING UP FOR "FURTHER PROCEEDINGS"

■ WHILE the national labor relations board last week announced it would vacate its order of April 5 directing Inland Steel Co., Chicago, to sign contracts with the CIO as sole bargaining agent for the latter's employes, Inland countered with a move intended to block the board's setting aside of the order.

Inland filed an appeal in the case, and after the board's announcement that it would vacate and set aside its findings "for the purpose of further proceedings" attorneys for the company filed an answer asking that the board show by what legal right it attempts to vacate its order. The company also says in its answer that if the board has the right to set aside the order it has no power to hold any further proceedings in the case.

Action by the board in attempting to set aside its order followed the decision of the United States Supreme Court reversing the findings in a similar case. (STEEL, May 9, p. 24). The board did not elaborate on what its "further proceedings" would be. Board officials point out that vacating the order is not a reversal of its opinion.

"We want this case tried on its merits and not on technical procedure," it was stated in Chicago by I. S. Dorfman, regional attorney for the board. "The company has attacked the board's decision in respect to procedure. In order to avoid any possibility that the court will decide the case on technicalities of procedure rather than on merit we decided to set aside the board's previous order and conform its procedure in every detail to requirements set down by the United States Supreme Court in the Morgan (Kansas City) stockyards case."

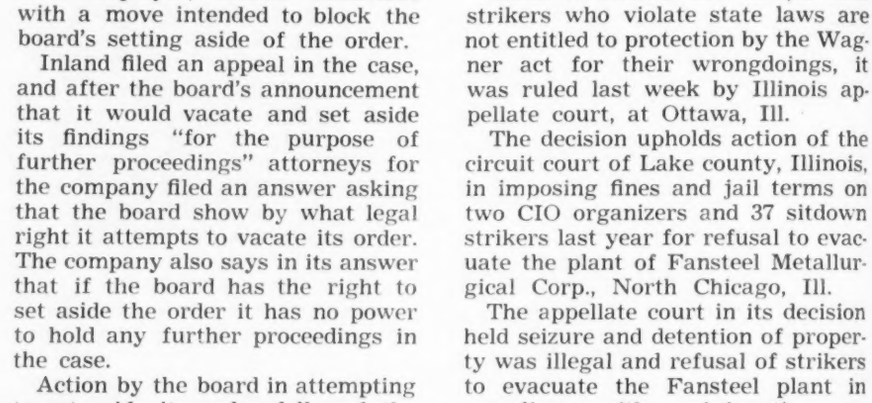
### SITDOWN STRIKES RULED ILLEGAL BY ILLINOIS COURT

Sitdown strikes are illegal and strikers who violate state laws are not entitled to protection by the Wagner act for their wrongdoings, it was ruled last week by Illinois appellate court, at Ottawa, Ill.

The decision upholds action of the circuit court of Lake county, Illinois, in imposing fines and jail terms on two CIO organizers and 37 sitdown strikers last year for refusal to evacuate the plant of Fansteel Metallurgical Corp., North Chicago, Ill.

The appellate court in its decision held seizure and detention of property was illegal and refusal of strikers to evacuate the Fansteel plant in compliance with an injunction was contempt of court. It was pointed out further by the court that the Wagner act takes no precedence over a state court of equity in a labor dispute.

## Automotive Engineers Inspect Steel Plant



■ **Members of the Chicago section, Society of Automotive Engineers, recently spent an afternoon of inspection in the Wisconsin Steel works of International Harvester Co., Chicago. Plant officials acted as hosts. At a dinner meeting, B. F. Courtright, superintendent of metallurgy and inspection, spoke on "Quality Control in Steel Manufacture."**

# New Free-Cutting Steel Introduced

■ INLAND Steel Co., Chicago, announces that it will introduce on a commercial basis shortly "a new open-hearth steel that has 20 to 50 per cent better machinability."

For a number of years Battelle Memorial institute, Columbus, O., and Inland's research division have been co-operating on the problem of developing an open-hearth steel that will have the machinability of bessemer steel and still retain the superior physical properties of open-hearth steel.

This research has culminated in the new steel. For several months it has been supplied to a few producers of cold-drawn bars, who have cold finished it for a limited group of customers for testing.

The steel has been tested in all types of machining and "has showed a marked superiority in machinability not only to open-hearth steel but to bessemer screw stock. Faster production has been obtained."

Large numbers of physical and heat-treating tests have demonstrated that the steel has the same physical properties and can be heat-treated in the same manner as regular steels of the same analysis. The tests on this steel in higher carbon analyses indicate the possibility of making steels that are truly "free machining" in these carbon ranges.

When used with sulphur in the usual screw machine grades the steel is said to give unprecedented machinability. When used with low sulphur in other grades the machining properties of screw stock and the physical properties of the low sulphur steels are obtained.

## Bliss & Laughlin Report On Machinability Tests

■ For several years it has been the aim of the bar steel industry to produce an open-hearth screw steel which would machine like bessemer steel and yet involve no sacrifice in physical character.

Bliss & Laughlin Inc., Harvey, Ill., last week announced it has engaged in extensive research to check the merits of "a new steel developed by one of the leading steel manufacturers which fulfills both of these requirements."

It is a steel the company says, which in analysis conforms to open-hearth SAE-1115, with the addition of a small percentage of lead to improve machinability.

"The machinability of this new steel will in most cases compare very favorably with, and in some cases exceed, that of bessemer SAE-X-1112. . . . The steel has been tried on many types of machine operations in sufficient quantities to have proved conclusively its superior machine quality.

"Research is also being conducted on the addition of lead to other grades of open-hearth steels."

Accompanying Bliss & Laughlin's announcement is a data sheet giving details of tests on the new steel.

## District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

| | Week ended May 14 | Change | Same week 1937 | Same week 1936 |
|---|---|---|---|---|
| Pittsburgh .. | 25 | None | 83 | 63 |
| Chicago ..... | 31.5 | — 1 | 84 | 71 |
| Eastern Pa... | 27.5 | None | 73.5 | 44.5 |
| Youngstown.. | 27 | — 3 | 83 | 76 |
| Wheeling .... | 38 | — 3 | 94 | 86 |
| Cleveland ... | 23 | — 5 | 79.5 | 75.5 |
| Buffalo ..... | 28 | None | 90 | 75 |
| Birmingham . | 66 | None | 83 | 69 |
| New England | 30 | None | 87 | 77 |
| Cincinnati ... | 25 | —15 | 94 | 80 |
| St. Louis .... | 33.3 | — 3 | 94 | † |
| Detroit ..... | 18 | None | 100 | 94 |
| Average.... | 30 | — 1 | 89 | 68.5 |

†Not reported.

## Ludlum and Allegheny Merger in Negotiation

■ Stockholders of Allegheny Steel Co., Brackenridge, Pa., and Ludlum Steel Co., Watervliet, N. Y., may be asked to vote on a merger proposal. Although officials of both companies declined to comment, it was reported negotiations are under way and that progress has been made.

Should the merger plan be completed, combined fixed assets would total $31,181,059, property account would be $17,790,519, earned surplus $10,789,163, and capital surplus $8,702,554. Currents assets would total $13,218,515 and current liabilities $3,186,506, leaving net working capital of $10,032,009.

Combined steel ingot capacity would be 537,516 tons annually, of which about 138,000 tons would be electric for manufacture of high-grade and stainless steels.

Allegheny produces wide flat-rolled steel principally while Ludlum produces tool and high-speed steels and other products which are not now made by Allegheny.

## Stoker Sales Up in March

■ Coal stoker sales increased sharply during March compared with February but declined about 30 per cent from March, 1937. Sales in March this year were 3882 units, against 2502 in February and 5574 a year ago.

# PRODUCTION

■ WITH production unchanged at six steel centers and small reductions in the remaining six the national operating rate last week dropped 1 point, to 30 per cent.

**Youngstown, O.**—Suspension of bessemer capacity by one interest caused a loss of 3 points, to 27 per cent. Operations this week are likely to be at 26 per cent.

**Pittsburgh**—Small revisions in schedules had no effect on the general rate, which remained at 25 per cent.

**Wheeling**—Down 3 points to 38 per cent as one producer reduced operations.

**Chicago**—Declined 1 point to 31.5 per cent. Further reductions are planned by some interests this week.

**Buffalo**—Unchanged at 28 per cent.

**New England**—Steady at 30 per cent, the same rate being scheduled for this week.

**Cincinnati**—Declined 15 points to 25 per cent. Under the alternating schedule the rate will be higher this week.

**Detroit**—No change from 18 per cent, the rate prevailing for the past seven weeks.

**Central eastern seaboard**—Continued steady at 27.5 per cent.

**Birmingham, Ala.**—Continued unchanged at 66 per cent, with the same rate scheduled for this week.

**St. Louis**—Two open hearths were taken off at one mill and one lighted at another, the rate declining 3 points, to 33.3 per cent.

**Cleveland**—Two open hearths were taken off, resulting in a drop of 5 points to 23 per cent. No further change as indicated for this week.

## Auto Output at New Low

■ Automobile production for the week ended May 14 declined 5970 to 47,415, according to *Ward's Reports*. This is the lowest output of any week since last October. Comparisons:

| | Week ended May 14 | Week ended May 7 |
|---|---|---|
| General Motors ..... | 20,200 | 23,285 |
| Chrysler ..... | 9,850 | 11,400 |
| Ford ..... | 12,385 | 11,885 |
| All others ..... | 4,980 | 6,815 |

Monthly and yearly comparisons will be found on page 36.

■ Increased use of pressed steel bodies and chassis frames, gradual elimination of the running board and substitution of a narrow concave finishing strip which is a part of the pressed steel body, are recent developments in the British automobile industry, according to the American consulate at Birmingham.

# MEN OF INDUSTRY

■ C. R. McDONALD has retired as vice president in charge of manufacturing, International Harvester Co., Chicago, after 43 years of active service. He will be succeeded by Fowler McCormick, second vice president, who has been in charge of foreign sales. L. P. Thayer, director of foreign sales, has been named a vice president and will have charge of foreign sales. E. A. Brittenham, manager of foreign sales the past three years, becomes director to succeed Mr. Thayer.

Mr. McDonald, whose retirement is effective June 1, began his business career with the old Plano Mfg. Co. at its West Pullman plant. He filled various positions with both the Plano and Harvester companies before being advanced to the vice presidency in June, 1936.

In his new post, Mr. McCormick will head the department in which he held his first position 13 years ago. He has had experience in the manufacturing, engineering, domestic and foreign sales departments.

♦

Ellis C. Folkening and Howard G. Warwick have been appointed representatives in Chicago territory for Rotary Electric Steel Co. (Michigan), Detroit, with headquarters in room 564, 20 North Wacker drive, Chicago.

♦

C. P. Whitehead, manager of sales, has been elected vice president in charge of sales, General Steel Castings Corp., Eddystone, Pa. E. G. Hallquist, chief mechanical engineer, has been named vice president in charge of engineering.

♦

C. William Howat Jr. has been named manager of steel mill sales, Thomas Flexible Coupling Co., Warren, Pa., with headquarters in Pittsburgh. Mr. Howat formerly was in the sales department, casting division, Allegheny Steel Co., Pittsburgh.

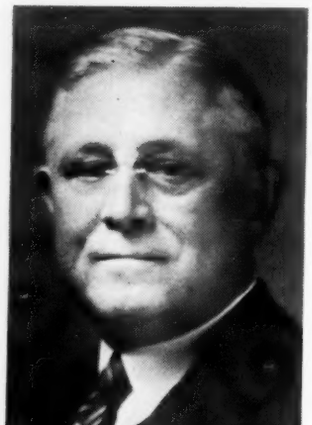
♦

F. T. Hays has resigned as superintendent, Fort Pitt Steel Casting Co., McKeesport, Pa., to become works manager, Warman Steel Casting Co., Los Angeles. John Marr, formerly works manager, Chicago Steel Foundry Co., Chicago, has been named by the Fort Pitt company to succeed Mr. Hays.

♦

Harry F. Devens, for the past five years president, Oliver Iron & Steel Corp., Pittsburgh, has been elected chairman of the board, and Theodore F. Smith, hitherto executive vice president, has been elected president.

The following directors have been re-elected: Henry Oliver Rea, James C. Rea, Charles Oliver, William J. Crittenden, D. L. Frawley, Harry F. Devens, Theodore F. Smith and John Jenkins.



Harry F. Devens

♦

W. O. Davis, western district assistant traffic manager, and George Low, western district office manager, United States Steel Corp., have retired. Both spent their business lives in the traffic field, Mr. Davis having been associated with corporation subsidiaries for 36 years and Mr. Low, 26 years.

♦

Harold H. Seaman, president, and Irving Seaman, secretary-treasurer, Seaman Body Corp., Milwaukee, subsidary of Nash Motors division of Nash-Kelvinator Corp., Detroit, have announced their resignations as of June 1. John Weiland, general superintendent for the past 16 years, will be in charge of the plant.

♦

R. F. Frenger, hitherto manager of Westinghouse Electric & Mfg. Co.'s small motor division at Lima, O., has been transferred to East Pittsburgh, Pa., as sales manager of the switchgear division. He succeeds W. R. Swoish, who has been transferred to the northwestern district as head switchgear specialist, with headquarters in Chicago.

Theodore F. Smith

♦

Harold E. Yale, long associated with the automotive industry in Detroit, has been elected president, Pyro-Electro Instrument Co., Detroit. Clarence E. Smith is vice president and chief engineer, and Charles H. Hitch is secretary-treasurer. The company recently moved to larger quarters at 7323-25 West Chicago boulevard.

♦

George P. Howell, director of purchases for the Seaman Body Corp., Milwaukee, has resigned to become district manager for Acme Steel Co., Chicago, in the Wisconsin and upper Michigan territory. Mr. Howell had been director of purchases with the Seaman corporation since 1921 and prior to that was assistant purchasing agent of Buick Motor Co., Flint, Mich.

♦

Borge Rosing has joined West Virginia Rail Co., Huntington, W. Va., as general sales manager. For the past three years he was associated with the International Derrick & Equipment Co., Columbus, O., as division sales manager, and before that was identified with the Mount Vernon Bridge Co., Mt. Vernon, O.; American Bridge Co., and Canadian Bridge Co. in various engineering capacities.

♦

Herbert H. Waldschmidt has been appointed director of purchases, Youngstown Sheet & Tube Co., Youngstown, O. Activities of the general purchasing department and the purchasing of raw materials will be consolidated under his direction June 1. Mr. Waldschmidt became associated with Sheet & Tube in 1920 at its Pittsburgh office and in 1923 was transferred to Youngstown as assistant to manager, raw materials department. He has been manager of that department since 1928. C. T. Moke will continue as purchasing agent.

♦

T. G. Delbridge, manager, research and development department, Atlantic Refining Co., Philadelphia, and W. M. Barr, chief chemist and metallurgist, Union Pacific Railroad Co., Omaha, Nebr., have been nominated for president and vice president, respectively, American Society for Testing Materials, Philadelphia. Among those nominated for the executive committee are: Dean Harvey, materials engineer, central material and process engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and J. J. Shu-

man, inspecting engineer, Jones & Laughlin Steel Corp., Pittsburgh.

♦

William J. McArdle has resigned as general sales manager, Allegheny Steel Co., Brackenridge, Pa. Mr. McArdle leaves the company after a period of 20 years, during which time he was closely identified with its development of electrical and stainless steels. After a short vacation he plans to resume his business activities in Pittsburgh.

♦

Andrew W. Soderberg, chief engineer, Homestead works of Carnegie-Illinois Steel Corp., and inventor of the "rocking shear" principle for cutting wide steel plate, will retire May 31, after 49 years of service with Carnegie-Illinois and its predecessor company. Born in Sweden, May 31, 1868, he was educated in the public schools there and in the United States. He joined the Homestead works of the former Carnegie Steel Co. in December, 1889, and in 1902 became assistant chief mechanical engineer. He was

**Raoul E. Desvernine**
Who has been elected president of Crucible Steel Co. of America, New York, as noted in STEEL, May 9, page 26

made chief mechanical engineer in 1915 and chief engineer in 1937.

In 1936, while preparing plans for the company's 100-inch semicontinuous plate mill, Mr. Soderberg anticipated the bow that would result if 90-inch plates were to be cut with straight-edge shears, and subsequently devised and patented an 80-ton rocker-shaped shear which has become a mechanical feature of modern plate mill operation.

He is a member, Association of Iron and Steel Engineers, and American Iron and Steel institute.

♦

A. F. White has been appointed general superintendent, Donora Steel and Wire Works, a consolidation of the Donora Steel Works and Donora Wire Works of the American Steel & Wire Co. Mr. White has been superintendent of the Steel Works.

J. C. Witherspoon, hitherto superintendent of steel production, becomes assistant general superintendent of the consolidated plant, in charge of blast furnaces, open hearth, blooming and billet mills. H. R. Patterson, previously superintendent, Rankin Works, becomes assistant general superintendent at Donora in charge of rod, wire and wire product mills, while C. J. Brown assumes the superintendency at Rankin.

**William J. McArdle**

Effective June 1, E. C. Morrison will be superintendent of industrial relations in the Pittsburgh district for American Steel & Wire Co. Ira Gribben has been appointed assistant to the manager of the district. Mr. Gribben at present is district personnel supervisor, and Mr. Morrison has been superintendent, Anderson, Ind., works.

# DIED:

■ JOSEPH LEMONT, 88, identified with the iron and steel industry 67 years, 32 of which were spent with the Tenneseee Coal, Iron & Railroad Co., in Birmingham, Ala., May 6. He went to Ensley, Ala., shortly after the Tennessee company began removing its works from South Pittsburgh, Tenn., to the Birmingham district. He was credited with aiding in the development of the duplexing process at the Ensley works.

♦

Anton Finkl, 89, founder and president, A. Finkl & Sons Co., Chicago, in that city, May 10.

♦

George M. Diehl, 67, president, G. M. Diehl Machine Works, Wabash, Ind., April 21.

♦

Richard P. Tell, 68, for 30 years treasurer and general manager, National Brake & Electric Co., Milwaukee, subsidiary of Westinghouse Air Brake Co., May 2. He retired in 1929.

♦

Ferdinand C. Kieckhefer, 48, factory manager, National Enameling & Stamping Co., Milwaukee, April 28.

♦

John Thomas Ralph, 68, head roller in the rail department, Gary works of Carnegie-Illinois Steel Corp., recently. He devised many improvements in making rails.

♦

William M. Purves, 48, associated with the automotive industry for 25 years and recently appointed general sales manager, Dodge division of Chrysler Corp., recently.

♦

William K. Glen, 60, Cleveland manager for Crane Co., Chicago, in Cleveland, April 28. He had been associated with Crane Co. since 1904.

♦

John J. Conn, 64, chief purchasing agent for the Santa Fe railroad, at his home in Oak Park, Ill., April 28. He had been associated with the road 49 years.

♦

Forrest E. Cardullo, 58, chief engineer, G. A. Gray Co., Cincinnati, in Cincinnati, May 7. Prior to joining the Gray organization in 1919, he was engineer of tests with the Curtiss Aeroplane & Motor Corp.

♦

John Nellis Klock, 72, one of the founders and president, Benton Harbor Malleable Industries Inc., Benton Harbor, Mich., and president of Muncie Malleable Foundry Co., Muncie, Ind., in Chicago, May 7.

♦

Charles F. Michael, 63, president Ohio Locomotive Crane Co., Bucyrus, O., in that city, May 4. Mr. Michael had been president, Ohio Manufacturers association since 1933 and was a director, National Manufacturers' association.

♦

Elon H. Hooker, 69, president, Hooker Electrochemical Co., New York, in Pasadena, Calif., May 10. He had long been identified with the chemical industry and was a former president, Manufacturing Chemists Association of the United States. He formed the Hooker organization in 1903.

♦

E. M. Sprague, 72, contracting manager at Bethlehem Steel Co.'s Cleveland office, in that city, May 8. He joined Bethlehem when that company took over McClintic-Marshall Corp. in 1930. He also was associated at one time with American Bridge Co. as manager of its Cleveland office.

♦

Edgar White Wagenseil, 54, for the past six years sales manager, Hagan Corp., Pittsburgh, in that city, May 10. A graduate of the University of Illinois, he was first employed as steam engineer for Illinois Steel Co., later becoming associated with Burke Furnace Co., Harrington Stoker Co., Westinghouse Electric & Mfg. Co., and Blaw-Knox Corp.

# MEETINGS

### METAL TRADES PROGRAM LISTS 14 ADDRESSES

■ PROGRAM for the fortieth annual meeting of the National Metal Trades association, Biltmore hotel, New York, May 25-26, includes 14 addresses on economic and management subjects.

Opening session features an address: "More Stable Employment and Economy," by W. E. Odom, William Odom Associates, Chicago. Scheduled for the afternoon session are: "Keeping Ahead of the Headlines," by Frederic Snyder, lecturer-publicist, Kingston, N. Y.; "An Appraisal of Factors in the Labor Relations Situation," by H. F. Browne, director of industrial management division, National Industrial Conference board, New York; "Employe Meetings with Management," by C. S. Craigmile, vice president, Belden Mfg. Co., Chicago; "How We Handle Our Employes," by C. C. Winegardner, vice president, Diamond Chain & Mfg. Co., Indianapolis; and "Legal Aspects of Labor Relations," by D. R. Clarke, Fyffe & Clarke, Chicago.

Subjects for the morning session of May 26 are: "A Community Program," by T. J. Morton Jr., president, Hoosier Lamp & Stamping Corp., Evansville, Ind.; "Restoring the Control of Wages and Working Hours to Management," by A. W. Rucker, president, Eddy-Rucker Nickels Co., Cambridge, Mass.; and "Job Evaluation," by O. D. Reich, vice president, Dexter Folder Co., Pearl River, N. Y.

For the afternoon session: "Metal Age or Paper Age," by Col. W. T. Chevalier, vice president, McGraw-Hill Publishing Co., New York; "What the CIO Has Done to Michigan," by Clare E. Hoffman, congressman from Michigan; "What Is Wrong with American Business Men," by P. C. Jones, president, S. M. Jones Co., Toledo, O.; and "America Wants To Know!" by C. W. Brooks, attorney, Chicago.

Josiah W. Bailey, senator from North Carolina, will speak at the dinner on "Government, Industry and Recovery."

### MACHINE TOOL DEALERS TO HEAR AUTOMOBILE MAKERS

Several representatives of the automobile industry will address the spring meeting of the Associated Machine Tool Dealers of America at Dearborn Inn, Dearborn, Mich., May 23-24. First day's opening session will feature an address on "Is the Customer Always Right?" by Henry G. Weaver, director customers' research division, General Motors Corp., Detroit.

A sales clinic will follow with these speakers: "Sales Talk vs. Just Talk" by George Habicht, Marshall & Huschart Machinery Co., Chicago; "Using the Office To Help the Salesman" by G. J. Hawkey, Cleveland Duplex Machinery Co., Cleveland; and "Selling Machine Tools by Selling Facts" by Jack C. Carlton, Calco Machinery Co., Philadelphia.

W. J. Cameron, Ford Motor Co., Dearborn, Mich., will speak at the banquet on "Machines Create Employment."

Tuesday morning's session will include a report on the 1938 Leipzig fair by N. P. Lloyd, Lloyd & Arms Inc., Philadelphia; an address by Howard W. Dunbar, Norton Co., Worcester, Mass., and president, National Machine Tool Builders' association; an address, "What the Machine Tool Buyer Wants To Know from the Machine Tool Seller" by David A. Wallace, Chrysler Corp., Detroit; and several committee reports.

Conditions in the European machine tool industry will be reviewed by E. H. Jones, E. H. Jones Machine Tool Co. Ltd., London; and Hugo D. Stokvis, R. S. Stokvis & Zonen, Rotterdam, Holland.

### A.S.M. CHAPTERS SCHEDULE PAPERS AT PENN STATE

Four technical papers are scheduled for the third biennial meeting of six American Society of Metals' chapters at Pennsylvania State college, State College, Pa., May 20-21. Participating are the Philadelphia, Pittsburgh, Lehigh Valley, York and Penn State chapters in Pennsylvania, and Southern Tier in New York. Program includes sessions for the afternoon of May 20 and morning of May 21 in the Mineral Industries building, and a dinner the first evening at Nittany Lion Inn.

Papers and authors are as follows: "Large Forgings, Their Manufacture and Properties," by A. O. Schaefer, engineer of tests, Midvale Co., Philadelphia; "Research—What, Why, How?" by L. C. Conradi, technical research director, International Business Machines Corp., Endicott, N. Y.; "History, Manufacture and Testing of High-Pressure Gas Cylinders," by A. F. Whalen, metallurgist, Harrisburg Steel Corp., Harrisburg, Pa.; and "Cold-Rolled Sheets and Their Applications," by J. C. Eckel, assistant manager of sales, sheet division, Carnegie-Illinois Steel Corp., Pittsburgh.

## Six Electric Locomotives Built for New Haven

■ Six fully streamlined single-phase electric locomotives for express passenger service on the New York, New Haven and Hartford railroad between New Haven, Conn., and New York have been built by General Electric Co. at Erie, Pa.

The 216-ton locomotives will handle fifteen 80-ton pullman cars, with provision for air conditioning and lighting equipment. Design permits normal operation at 80 miles per hour, maximum 90 miles.

Platform is built up of structural steel longitudinal and cross sills with structural steel brace plates and a 3/16-inch steel floor. Cab consists of framework of steel shapes covered by sheets of 12-gage copper-bearing steel welded in place.

# FINANCIAL

### U. S. STEEL TELLS SEC HOW PROCEEDS WILL BE SPENT

■ UNITED States Steel Corp. last week filed its registration statement with the securities and exchange commission covering $100,000,000 of ten-year debentures, dated June 1, 1938. Interest rate and the price at which the debentures will be offered will be supplied by amendment to the registration statement. The issue is the largest ever filed with SEC by an industrial corporation.

Of the net proceeds, $50,000,000 will be used to repay bank loans incurred last February. The remainder will be added to the cash funds of the corporation, as were the proceeds of the bank loans, to be used for modernization, extension and replacement of manufacturing plants and facilities of subsidiaries.

Expenditures for such capital additions last year totaled about $135,000,000, and at Dec. 31, 1937, authorizations for incompleted work in progress contemplated additional expenditures totaling approximately $80,000,000. These included:

Completion of new hot strip mill and cold reduction sheet and tin mills at the Irvin works near Clairton, Pa., and the new slabbing mill at Edgar Thomson works at Bessemer, Pa., to be used in connection therewith, to cost $46,500,000.

Completion of blooming and slabbing mill and new facilities for cold reduced tin plate in Birmingham district to cost $5,805,000.

Completion of new facilities at Cuyahoga works, Cleveland, for manufacture of cold-rolled strip to cost $3,685,000.

Completion of modernization of cement plants at Hudson, N. Y., Independence, Mo., and Leeds, Ala., at $2,125,000.

Completion of four new ore carriers for the Great Lakes at $1,575,000.

Miscellaneous capital expenditures on various plants and facilities to cost $20,310,000.

# Loss in Finished Steel Production

■ FINISHED steel made for sale in the first quarter this year totaled 4,337,166 gross tons, 61.7 per cent less than the 11,347,300 tons in the period last year, and 25.3 per cent less than the 5,808,173 tons in the fourth quarter of 1937, according to the American Iron and Steel institute.

The percentage active in sheet tonnage was greater than the average, due mainly to sharp curtailment in consumption by the automotive industry. Output was 788,388 tons, 65.4 per cent less than the 2,283,091 tons made in first quarter of 1937, and 33.6 per cent below the total of 1,187,497 tons in fourth quarter.

Production of heavy steel amounted to 307,795 tons, 56.3 per cent less than the 704,326 tons made in first quarter last year, and 9.4 per cent under the 339,811 tons in fourth quarter.

Standard steel rails totaled 119,578 tons compared with 415,907 tons in first quarter last year, a loss of 52 per cent, and with 171,162 tons in fourth quarter, a decline of 30 per cent.

Other products showed parallel losses in tonnage, plates dropping to 311,837 tons in first quarter from 426,025 tons in fourth quarter and 808,313 tons in first quarter, 1937. Bars totaled 618,358 tons in first quarter, 874,984 tons in fourth quarter and 1,845,649 tons in first quarter last year.

Tin plate held up better than any other classifications, with 356,022 tons in first quarter, against 521,037 tons in fourth quarter and 585,073 tons in first quarter, 1937. The combined tonnage of hot and cold-rolled strip fell sharply, first quarter tonnage being 232,854 tons, compared with 447,108 tons in fourth quarter and 927,193 tons in first quarter last year.

Figures in the accompanying table include reports from 165 companies and the tonnages represent 70.6 per cent of the ingots produced by companies whose products are included in the tabulation. Total production less shipments to members of the industry for conversion into further finished products, during first quarter was 4,011,439 gross tons, 33.3 per cent of finishing capacity. This compares with 84.6 per cent for first quarter, 1937, and 46.1 per cent for fourth quarter.

| | | Number of companies | Items | Annual Capacity Gross tons | Production for Sale—Gross Tons First Quarter - 1938 | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Total | Per cent of capacity | Shipments: Export | Shipments: To members of the industry for conversion into further finished products |
| Steel Products | Ingots, blooms, billets, slabs, sheet bars, etc. | 27 | 1 | xxxxxxx | 352,561 | xxx | 74,906 | 149,460 |
| | Heavy structural shapes | 8 | 2 | 4,657,100 | 307,795 | 26.4 | 17,985 | - |
| | Steel piling | 3 | 3 | 234,500 | 18,716 | 31.9 | 1,344 | - |
| | Plates—Sheared and Universal | 20 | 4 | 5,879,710 | 311,837 | 21.2 | 38,343 | 1,318 |
| | Skelp | 6 | 5 | xxxxxxx | 74,684 | xxx | 1,983 | 57,012 |
| | Rails—Standard (over 60 lbs.) | 4 | 6 | 3,395,000 | 199,578 | 23.5 | 12,403 | - |
| | Light (60 lbs. and under) | 6 | 7 | 436,500 | 12,133 | 11.1 | 2,630 | - |
| | All other (Incl. girder, guard, etc.) | 2 | 8 | 120,000 | 2,877 | 9.6 | 1,268 | - |
| | Splice bar and tie plates | 14 | 9 | 1,377,693 | 56,669 | 16.5 | 1,093 | - |
| | Bars—Merchant | 37 | 10 | xxxxxxx | 354,448 | xxx | 30,122 | 50,004 |
| | Concrete reinforcing—New billet | 13 | 11 | xxxxxxx | 113,409 | xxx | 8,333 | - |
| | Rerolling | 19 | 12 | xxxxxxx | 24,897 | xxx | 1,639 | - |
| | Cold finished—Carbon | 18 | 13 | xxxxxxx | 52,763 | xxx | 2,728 | - |
| | Alloy—Hot rolled | 15 | 14 | xxxxxxx | 55,563 | xxx | 3,386 | 7,377 |
| | Cold finished | 14 | 15 | xxxxxxx | 5,506 | xxx | 268 | - |
| | Hoops and baling bands | 4 | 16 | xxxxxxx | 11,772 | xxx | 344 | - |
| | TOTAL BARS | 56 | 17 | 11,625,881 | 618,358 | 21.3 | 46,820 | 57,381 |
| | Tool steel bars (rolled and forged) | 15 | 18 | 100,941 | 4,109 | 16.3 | 22 | - |
| | Pipe and tube—B. W. | 16 | 19 | 1,765,872 | 96,972 | 22.0 | 4,652 | - |
| | L. W. | 11 | 20 | 1,469,099 | 79,690 | 21.7 | 4,325 | - |
| | Electric weld | 4 | 21 | 588,107 | 32,908 | 22.4 | 5,576 | - |
| | Seamless | 14 | 22 | 2,834,328 | 257,384 | 36.3 | 27,402 | - |
| | Conduit | 7 | 23 | 155,270 | 8,272 | 21.3 | 330 | - |
| | Mechanical Tubing | 5 | 24 | 189,000 | 12,831 | 27.2 | 1,120 | - |
| | Wire rods | 17 | 25 | xxxxxxx | 75,088 | xxx | 9,533 | 22,424 |
| | Wire—Drawn | 38 | 26 | 1,927,127 | 152,914 | 31.7 | 8,690 | 1,851 |
| | Nails and staples | 19 | 27 | 1,130,956 | 89,278 | 31.6 | 4,469 | - |
| | Barbed and twisted | 16 | 28 | 462,377 | 26,531 | 23.0 | 3,613 | - |
| | Woven wire fence | 15 | 29 | 710,532 | 50,064 | 28.2 | 201 | - |
| | Bale ties | 11 | 30 | 115,277 | 7,025 | 24.4 | - | - |
| | All other wire products | 4 | 31 | 27,000 | 959 | 14.2 | 1 | - |
| | Fence posts | 14 | 32 | 146,800 | 9,412 | 25.6 | 197 | - |
| | Black plate | 12 | 33 | 494,194 | 62,765 | 50.8 | 2,066 | 18,664 |
| | Tin plate—Hot rolled | 11 | 34 | 1,694,206 | 190,250 | 44.9 | 70,115 | - |
| | Cold reduced | 10 | 35 | 1,747,671 | 165,772 | 37.9 | 14,683 | - |
| | Sheets—Hot rolled | 19 | 36 | xxxxxxx | 171,564 | xxx | 24,879 | 1,221 |
| | Hot rolled annealed | 19 | 37 | xxxxxxx | 165,906 | xxx | 12,882 | 79 |
| | Galvanized | 15 | 38 | xxxxxxx | 169,609 | xxx | 19,759 | - |
| | Cold rolled | 17 | 39 | xxxxxxx | 230,596 | xxx | 24,240 | - |
| | All other | 15 | 40 | xxxxxxx | 50,713 | xxx | 3,650 | - |
| | TOTAL SHEETS | 26 | 41 | 10,382,167 | 788,388 | 30.4 | 85,410 | 1,300 |
| | Strip—Hot rolled | 25 | 42 | 3,252,165 | 171,095 | 21.0 | 13,206 | 16,317 |
| | Cold rolled | 37 | 43 | 1,178,989 | 61,759 | 21.0 | 1,749 | - |
| | Wheels (car, rolled steel) | 5 | 44 | 380,319 | 14,239 | 15.0 | 335 | - |
| | Axles | 4 | 45 | 425,900 | 10,204 | 9.6 | 3,119 | - |
| | Track spikes | 11 | 46 | 308,458 | 12,460 | 16.2 | 310 | - |
| | All other | 4 | 47 | 22,107 | 1,589 | 28.7 | 3 | - |
| | TOTAL STEEL PRODUCTS | 142 | 48 | xxxxxxx | 4,337,166 | xxx | 459,902 | 325,727 |
| | Estimated total steel finishing capacity based on a yield from ingots of 70.6 % | - | 49 | 48,152,500 | xxxxxxx | 33.3 | xxxxx | xxxxxxx |
| Iron Products | Pig iron, ferro manganese and spiegel | 29 | 50 | xxxxxxx | 857,596 | xxx | 107,897 | 88,108 |
| | Ingot moulds | 4 | 51 | xxxxxxx | 25,405 | xxx | 1,527 | - |
| | Bars | 12 | 52 | 230,519 | 4,309 | 7.5 | 16 | - |
| | Pipe and tubes | 4 | 53 | 185,457 | 6,996 | 15.1 | 214 | - |
| | All other | 2 | 54 | 63,560 | 1,717 | 10.8 | 100 | 608 |
| | TOTAL IRON PRODUCTS (ITEMS 52 to 54) | 14 | 55 | 421,576 | 13,022 | 12.4 | 330 | 608 |

## Machine Tool Orders Reflect Low Production

■ Machine tool orders index for April was 90.3, compared with 107 in March and 75.7 in February, according to the National Machine Tool Builders' association, Cleveland. In April, 1937, the index stood at 282.5.

Domestic orders were 43.9 in April, compared with 50.5 in March and 232.5 in April, 1937. Foreign orders index stood at 46.1 in April, against 56.5 in March, and 50 a year ago.

Foreign orders accounted for 51 per cent of total business. In the same month last year, foreign orders were 17 per cent of the total.

Three-month average total index fell to 91 in April, lowest point since June, 1935. In the first four months of 1938 domestic orders have held steadily within a narrow range. Foreign demand has been less steady, but has been of major importance.

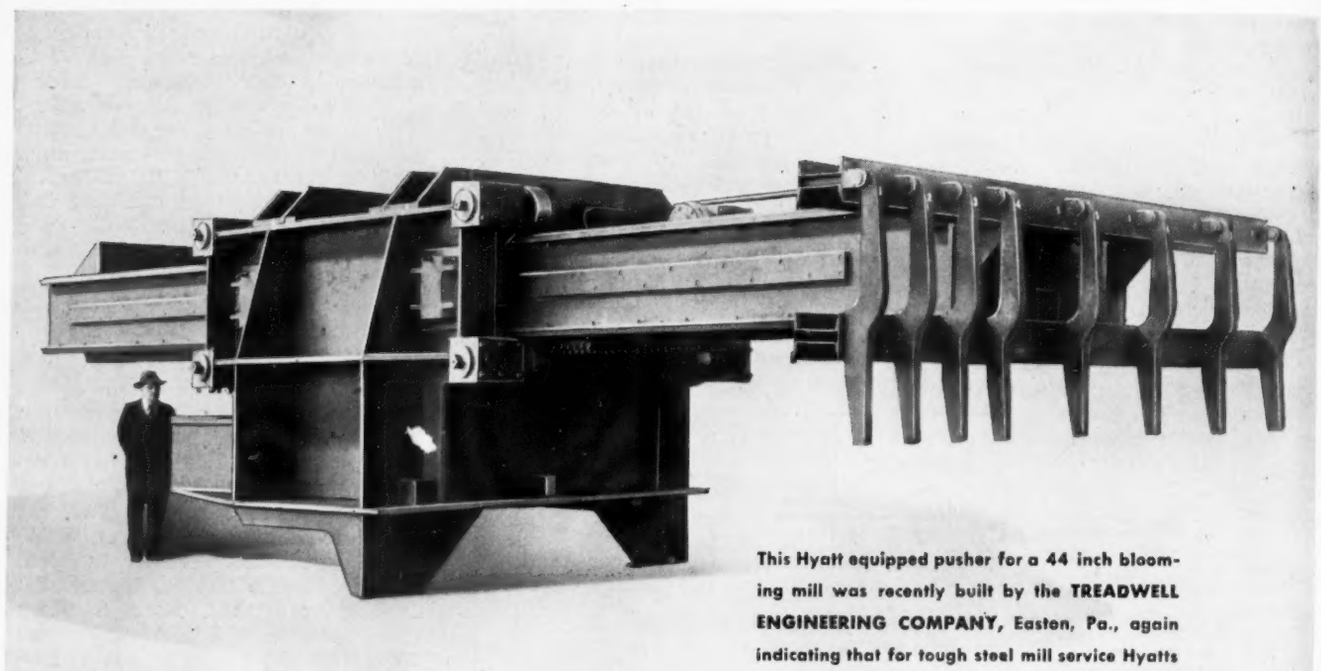
## 21 Employes Feted for 1023 Years of Service

■ Peck, Stow & Wilcox Co., Southington, Conn., recently honored 21 employes who have served the company 40 years or more and whose service record totals 1023 years. The veterans were guests at a dinner given by the Manufacturers' association of Hartford county for 40-years-or-more workers.

More than 600 veterans and executives of Hartford county companies attended the dinner. Governor Cross of Connecticut was the principal speaker.

■ Welders' and welding day will be observed at the 1939 Golden Gate exposition on San Francisco bay, Sunday, Sept. 24. Several prize events in cutting and welding have been scheduled. Among the more spectacular features will be a demonstration of under-water cutting by divers in an especially constructed tank.

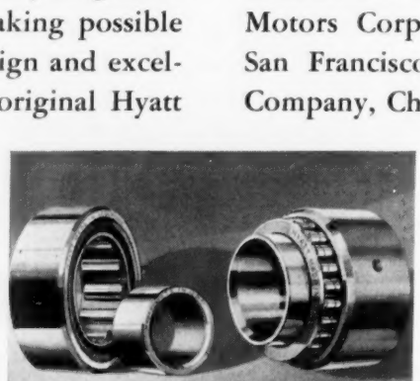
# *Higher and Higher Speeds...*



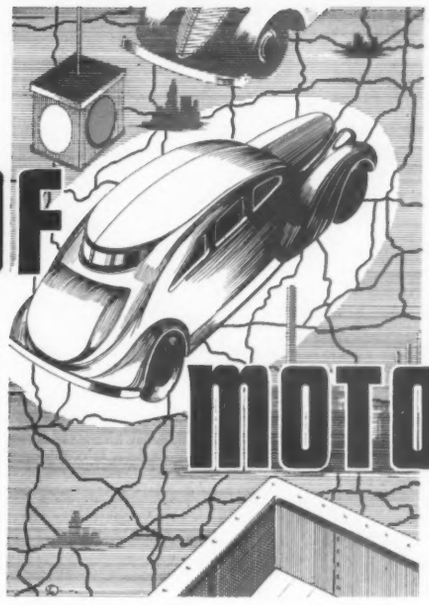
This Hyatt equipped pusher for a 44 inch blooming mill was recently built by the **TREADWELL ENGINEERING COMPANY,** Easton, Pa., again indicating that for tough steel mill service Hyatts are usually preferred.

## *...call for* HYATTS

THE insistent demand today is for faster production and higher speeds. And higher speeds, in turn, make their own demands—for increased smoothness, for decreased friction, *for Hyatt Roller Bearings!* Because Hyatt Roller Bearings function so smoothly, so friction-free, so enduringly that they are adding daily to greater progress and, in addition, are making possible new standards of engineering design and excellence. In many applications the original Hyatt Roller Bearings are still serving the mechanism of which they are a part . . . Because they are built to inconceivably precise standards of workmanship . . . Because they are made of the finest bearing steel . . . Because they are built to stand up under punishing speeds and loads. Consult the Hyatt Bearings Division, General Motors Corporation, Harrison, N. J., Detroit, San Francisco, or Hyatt Roller Bearing Sales Company, Chicago and Pittsburgh.

**HYATT**  **ROLLER BEARINGS**

# MIRRORS OF MOTORDOM



*DETROIT*

■ MANY an auto worker here is in process of "holing in" for a bad summer, turning to farming and gardening as a means of filling the void created by idle assembly lines. Vacant lots throughout the city are being transformed into well cultivated farm plots and are being planted with a wide variety of truck produce. Perhaps more than many realize, Henry Ford's "back to the farm" advice is being followed.

Hundreds of plant employes are becoming resigned to the probability working hours will be short this summer. Not until 1939 model production is given the gun is there much likelihood of a return to normal employment. Wind-up of 1938 production still is some weeks away, but workers with a weather eye to the future are drawing up plans for a thin July and August.

This experience is nothing new to automobile plant workers, for it has been characteristic of the industry for years that it was "either feast or famine," and efforts to strike a happy medium have been unsuccessful. Knowing this, it is not so difficult to set a little extra aside for hard times and trust their duration will not be prolonged.

### Hope for Early Recovery

For one thing, they believe, the very speed of the downward spiral into the present business recession is one of the best indications the ascent will be equally rapid. And so, hope for fall improvement is strong.

However, auto producers are less sanguine in their outlook for the coming new model season. Chevrolet, for example, is reported to have set an estimate of 700,000 cars as the probable extent of 1939 model output, compared with the million and a quarter total for 1936 and 1937 model years. This downward revision of output has an important bearing on dies for new models. Whereas with the higher production two sets of dies were required for such parts as fenders, next year it is likely one set will suffice.

Chevrolet is understood to have two designs developed for 1939 models, giving rise to the prediction next year will see two distinct series of Chevrolet models—one a rather pronounced and radical step toward more complete streamlining, and one a more conservatively styled design along standard lines.

Body and chassis engineers are proceeding along the lines of eventually developing a rear-engine design, but the transition must be made gradually to retain the public's favor. Thus, front ends probably will be gradually more rounded off and cut back until, say in, four or five years, the driver can be located at the extreme front of the vehicle and the engine placed in the rear. Evidences of this gradual change will be noted on several of next year's models.

A considerable volume of die work for Chevrolet, and for other General Motors lines too, is being let in the East this year, some plants in the Philadelphia district currently op-

**BY A. H. ALLEN**
*Detroit Editor, STEEL*

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## Spot Welding Pontiac Side Grilles

■ **Assembly of radiator side grilles for Pontiac is accomplished on this new turntable arrangement. Two welders work inside the circle and four outside, spot welding the series of chromium-plated steel bars comprising the grille. Other workmen spot pieces in welding jigs and unload finished units**

erating at 24-hour capacity on new model work. Reasons for the gravitation of this work eastward appear to be twofold. First, these suppliers are the logical ones to feed eastern assembly plants from the standpoint of geographical locations; second, labor rates on tool and die work are lower outside Detroit. Further, the inroads of unionization have not been so effective in these plants.

Balancing the effect of low wage rates in outside plants is the fact most of them do not have the thoroughly modernized and mechanized facilities enjoyed by local tool and die shops, the result being in some cases that despite lower wage levels out-of-Detroit shops can show no important savings over local interests. Word is being passed around to look for some radical changes on the part of Studebaker next year. This business was awarded to a Philadelphia body supplier who has already issued releases on some sample lots of steel for die tryouts.

A completely new front-end design for Willys is now also going through the die shop and will be ready for try-out shortly.

Packard has been approached with the proposal body manufacture for its two junior lines be given to an outside interest for next year. This work is now being done in the Packard plant, but savings of $6 per body are reported to have been outlined under the new setup. It has been common knowledge in trade circles that Packard's body costs are above the average.

As an adjunct to the above proposal it is rumored the body supplier, if the plan is accepted, may conclude a deal to take over the stamping plant and final assembly line in the Hupp plant here, and set them up for Packard bodies. The company involved holds a number of patents on steel body construction which other builders cannot take advantage of, and which permits reductions in body costs.

Some new model die work for Chrysler and DeSoto has been released in the past week or so, but nothing which would give a clew to any radical changes in lines. The DeSoto stamping plant here will take over fabrication of hood tops and sides for the Chrysler line, this work now being done by an outside supplier. More and more stamping work for the Chrysler units is being concentrated in this new plant, although Briggs will continue to supply a large share of body requirements.

■ FIRST quarter report by Chrysler Corp., with earnings equal to 48 cents a share on the common stock, occasioned considerable surprise in financial circles, but locally it mirrored the efforts the corporation has made to retrench with the times. The net of $2,109,969 was made on the sale of 122,928 cars. About 40 per cent of first-quarter income was realized from sale of shares of Commercial Credit Co. But even excluding this, the profit far exceeded reports which brokerage houses were circulating before the announcement.

Extent to which inventories were scaled down in the first quarter is shown by the figure of $39,824,289 as of March 31, compared with $50,132,862 at the beginning of the year.

## Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

| | 1936 | 1937 | 1938 |
|---|---|---|---|
| Jan. | 377,244 | 399,186 | 227,744 |
| Feb. | 300,810 | 383,900 | 202,872 |
| March | 438,943 | 519,022 | 238,753 |
| 3 mos. | 1,116,997 | 1,302,108 | 669,369 |
| April | 527,625 | 553,231 | *245,000 |
| May | 480,518 | 540,377 | ..... |
| June | 469,368 | 521,153 | ..... |
| July | 451,206 | 456,909 | ..... |
| Aug. | 275,934 | 405,072 | ..... |
| Sept. | 139,820 | 175,630 | ..... |
| Oct. | 230,049 | 337,979 | ..... |
| Nov. | 405,799 | 376,629 | ..... |
| Dec. | 518,958 | 346,886 | ..... |
| Year | 4,616,274 | 5,015,974 | ..... |

*Estimated.

| Week ended | |
|---|---|
| April 16 | 62,021 |
| April 23 | 60,563 |
| April 30 | 50,755 |
| May 7 | 53,385 |

(Production figures for the week ended May 14 will be found on page 29.)

■ HOMER MARTIN continues to keep a firm hold on the reins of the UAW, despite a three-cornered split which has developed in the ranks of his members. Richard T. Frankensteen, leader of the "harmony" faction, has been demoted from assistant president to a plain vice president, and there is much speculation over whether or not he will now throw his strength into the camp of Walter P. Reuther, leader of a radical section of the UAW. Martin appears to have a majority of 14 to 10 in the union's executive board which has been in session here. The board has announced its intention of punishing those responsible for "wildcat" strikes which have broken out in a number of plants here in the past few weeks, said punishment to involve expulsion from the union, temporary suspension or a request for the victim's employer to discharge him. However, the board has yet to apply the discipline.

All strike-bound plants save one have reopened, and the latter was planning to resume late last week after receipt of what were termed urgent government orders for parts. Meanwhile an agreement has been reached between Briggs and the UAW, continuing the union contract for the time being.

■ AUTOMOBILE parts plants are working hard on attempts to diversify their products to level off seasonal dips in automobile production. Otherwise they find their appetites for automotive business growing abnormally keen, and some unusually low prices for stampings are reported.

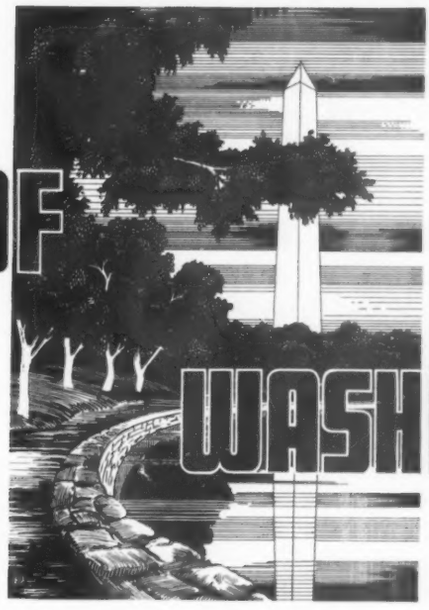
The trend toward diversification has been a keynote of industrial operations in Toledo, O., for several years now. Electric Auto-Lite Co., for example, now makes more than 100 products and has reinforced its large automotive business with such items as stainless steel kitchenware, artificial leather goods, etc. Die casting companies are pushing into the field of household equipment. Steel tubes are being adapted on a wider scale for home and office furniture. Stamping plants are seriously cultivating such products as rowing machines, toys and household equipment.

Surface Combustion Corp. is attempting to offset seasonal demand for its gas-fired domestic heating equipment with a new air-conditioning system which depends upon chemical drying of the air, using a substance called "kathabar" derived from lithium chloride.

■ SLOWING up of new construction programs is reported at the Ford Rouge plant. While steelwork for the new press shop and tool and die shop has been received and partially erected, it is understood present plans call for holding in abeyance the completion of these new structures and their equipping. It is possible the consummation of a better deal with a body supply source here may be the explanation behind suspension of work on the new press shop which was to include body assembly work; this plus the fact that important scaling down of probable output for next year has been necessary.

Residents along the New York state barge canal this summer will see regularly the two new Ford motorships, NORFOLK and GREEN ISLAND. The former docked last Friday at the Ford Norfolk, Va., plant on its first voyage at a new dock on the James river which, along with an addition to the assembly plant, has been completed recently. The vessels carry 2200 tons of material and parts each from Dearborn to Ford plants at Green Island, N. Y., Edgewater, N. J., Chester, Pa., and Norfolk. They are powered by twin screw 600-horsepower diesel engines.

# WINDOWS OF WASHINGTON



*WASHINGTON*

■ THE WHOLE situation in regard to the wages and hours bill was changed last week when Chairman O'Connor of the house rules committee introduced a resolution which would allow a vote at any time.

Representatives Mapes, Michigan, and McLean, New Jersey, changed their vote in the rules committee to permit the O'Connor resolution to be reported out. If this had not been done, the house under its rules could not have voted on the wages and hours bill until May 23, which would unquestionably have delayed congressional adjournment.

The change of stand by these congressmen permitted the rules committee to reverse its former 8-to-6 vote against granting the wage-hour bill right of way to the floor, by allowing passage of the new O'Connor resolution waiving the rules. This action will allow Mrs. Norton, chairwoman of the house labor committee, to call the bill up before May 23, which previously has been the earliest possible date for its consideration.

This action brightened the prospects of both the bill and early adjournment, as every major figure in the fight is convinced that the time element is one of the most vital in the bill's chances.

There has been a feeling that if the house passed the bill it would be filibustered to death in the senate, but no southern democrat in the senate has thus far shown a willingness to lead in opposing the legislation.

### MILDER PROFITS TAX MAY ENCOURAGE BUSINESS

The new tax bill which has been under way since last November will become law within a few days. While business and industry did not get everything they asked, under existing conditions they probably got more than could reasonably have been expected.

Both the senate and house have finally approved the compromise tax bill, and it has been forwarded to the White House for the President's signature. As the senate conferees yielded to the administration on a matter of principle, there is no question Mr. Roosevelt will sign the bill.

This new $5,000,000,000 measure passed the senate in record time, a little over five minutes, and the final passage was by a voice vote with no negatives heard.

The bill, as it finally becomes law, will retain for two years a modified version of the undistributed profits tax. This taxation principle, originally rejected by the senate, was written into the bill after President Roosevelt had indorsed it in a letter to the conference committee. If this compromise had not been adopted, it was considered by many that the President might have undertaken to veto the bill, which would have thrown it back into congress and have further postponed adjournment. This is the last thing desired by congressional members.

**BY L. M. LAMM**

***Washington Editor, STEEL***

### BETTER BALANCE SOUGHT IN LABOR RELATIONS LAW

James A. Emery, general counsel for the National Association of Manufacturers, appeared last week before a subcommittee of the house judiciary committee in opposition to the bill to extend the authority of the national labor relations board in connection with the Wagner-Healey bill.

"With business at a low ebb and relief rolls mounting," Mr. Emery told the committee, "congress should not consider expanding powers of the national labor relations board, which, in the eyes of many employers, is doing much to cause existing strife and uncertainty. Instead, congress should take steps to assure that power and responsibility go hand in hand; and that collective bargaining contracts be made equally binding on both parties."

The proposed amendment would extend authority of the labor board over all who borrow from or sell to the government, including municipalities and other political subdivisions. He made the following suggestions as amendments:

1. "The act should be amended so that benefits of the legislation would be withheld from those who by concerted action interrupt production or service in violation of an agreement which they have voluntarily made, or because of a dispute which they have solemnly agreed to arbitrate without interruption of service."

#### Ban on Sitdown Strike

2. "The same principle should apply to require the presentation of demands and reasonable opportunity for their consideration before breaking the employment relation."

3. "No group should receive the benefits of the act who precede or accompany their proposals or demands by the lawless seizure or occupation of property and the denial of access to it either to the owners or to those workers who wish to exercise their right to remain at work."

4. "The benefits of the act should not extend to those who coerce membership in their organization any more than to employers who undertake to coerce or compel membership in any particular organization. Coercion by the one is no less tyranny than coercion by the other."

5. "Employers should not be compelled to deal with an organization

of their own supervisory officials who stand in the employers' shoes and exercise the employers' authority as his representative."

6. "The act should not confer its benefits upon those who enforce their demands by systematic violence and intimidation of either their fellow employes or the public, or who prevent the employer or employes from operating and working under the labor board's own award."

### BURKE SEEKS DATA FOR REVAMPING LABOR LAW

Some 40,000 letters have been sent out to employers and employes by Senator Burke, Nebraska, asking for suggestions for changing the national labor relations board act.

Senator Burke has been a consistent critic of the board and, while he realizes that it will be impossible to obtain changes in the act at the present session of congress, he will make an effort to have it overhauled at the next session of congress. He states that he has received several thousand replies, principally from industrialists and business men.

Senator Burke said many of the replies urged that some provision be made to fix employe responsibility under the law and to prevent the labor relations board from acting "both as prosecutor and judge" in collective bargaining cases.

The Nebraska senator said he was seeking some way to define "employe responsibility" and "unfair" labor practices. Sit-down strikes should be strictly prohibited, he asserted.

Discussing possible methods of separating the board's present functions, Senator Burke said he was considering a plan to make the board simply a prosecutor.

It could prepare cases and present them to a federal court for trial, he said. Board attorneys could aid in prosecution.

### AID FOR RAILROADS SEEN LIKELY THIS SESSION

Sentiment on Capitol Hill seems to indicate that some kind of remedial railroad legislation will be passed before congress adjourns.

The legislation will be divided into three parts. First, the railroads under the proposed legislation would be able to borrow money from the RFC for equipment purchases. Second, they would be able to borrow money for wage payment, provided a large part of this is used to rehire employes who have been let out because of lack of work. Third, and this has not been sufficiently stressed, the roads would be able to borrow money to pay interest on bonded indebtedness. In this latter case, it is probable that many of the roads would not be able to borrow funds from any other source. There is a feeling that if this legislation is enacted it should tide the roads over a bad period.

### FEDERAL ROAD BUILDING FUNDS ARE ASSURED

More, better and safer roads for the 29,000,000 highway users of the nation were provided for last week when the house of representatives passed the new Cartwright road bill. This authorizes the expenditure of $238,000,000 by the federal government for highways during the fiscal year 1940 and the same amount for the fiscal year 1941. Congressman Wilburn Cartwright, Oklahoma, was sponsor of the bill and chairman of the house roads committee.

Charles M. Upham, engineer-director, American Road Builders' association, declared: "This is a red-letter day for the American motorist. Continuation of federal aid for highways through 1940 and 1941 will make possible the modern construction of much-needed safe highways in all the states. It will help considerably to diminish traffic-accident fatalities."

### JAPAN WILL REQUIRE HEAVY STEEL IMPORTS

It is stated there appears little doubt that Japanese iron and steel consumption in 1938 will reach a new high and will exceed domestic output by a substantial amount, according to information received from the office of the American commercial attache at Tokyo. Apparently every effort will be made to attain a greater measure of self-sufficiency, particularly with respect to raw materials. It appears that there exists at the moment a large potential demand for imported iron and steel products in Japan, it being estimated conservatively that that country will need at least 800,000 tons of pig iron, about 2,000,000 tons of scrap, 300,000 tons of ingots and other semimanufactures, and from 600,000 to 800,000 tons of manufactured iron and steel items. It appears that Japan will not be an important factor in the export market since every effort is being made to utilize local output for domestic requirements. Furthermore, domestic prices are said to be considerably out of line with the world level, thus making it difficult for Japan to compete even in nearby markets.

### DRAFT NEW MANGANESE BILL

A committee of government experts was at work last week drafting a bill for the purchase of manganese ore by the government, to replace the bill introduced some weeks ago by Senator Miller.

This committee has been working, as the result of a request by Senator Thomas, Utah, chairman of a subcommittee on the senate committee of military affairs, who heard these government experts a couple of weeks ago state that they could not indorse the Miller bill as it was drafted. In spite of all the work that is being put on this new draft, there seems to be little likelihood that it can be enacted into law during the present session.

### HOOK ASKS TAX REFORM

Charles R. Hook, president of the American Rolling Mill Co. and of the National Association of Manufacturers, has sent to congress on behalf of the association a communication urging appointment of a national non-partisan commission to examine the national taxation structure and recommend simplification and improvement.

Mr. Hook described the current tax bill "as a real step forward" which will drastically reduce the burdens of the present tax on undistributed corporate earnings.

### BOLIVIA HOPES TO SELL TIN TO UNITED STATES

Luis Fernando Guachalla, minister from Bolivia, made a talk last week on economic co-operation in the Americas, in which he expressed hope that his government and the United States might reach an agreement concerning Bolivia's supply of tin, vital peace and war time material, which this country has to import.

"Bolivia is the second producer of tin in the world," said Minister Guachalla, "in spite of the fact that her mining industry is still in its early stages and awaiting the capital and technical assistance from outside which will aid its more rapid development."

He pointed out that the United States' dependence on foreign tin markets might make it difficult in an emergency to insure adequate supplies.

### TETLOW HEADS COAL BODY

Percy Tetlow has been elected permanent chairman of the national bituminous coal commission, of which he has been acting head since the retirement of the former chairman, Charles H. Hosford Jr. He formerly was a coal miner in Ohio and is an official of the United Mine Workers union.

The commission was set up under the Guffey law to regulate the production and prices of bituminous coal.

### ALL TIN SCRAP TO JAPAN

According to announcement of the state department, during April 16 licenses were issued for exportation of 1109 tons of tin plate scrap valued at $18,972. The licenses were all issued for Japan as a destination.

# Modern Industrial Executive Must Possess Diversified Qualifications

■ AT THE triple mill supply convention in Pittsburgh last week, Roger Tewksbury, Oster Mfg. Co., Cleveland, gave apt expression to a belief that has become widespread among industrial leaders. Said Mr. Tewksbury:

"The successful industrial executive of today must be part lawyer, part certified public accountant, part tax expert, part labor and part public relations man."

That is true. He must be all those things in addition to having all the other abilities required in running a business.

And yet the problems of an industrial executive do not look so terrifying at present as they did a year or so ago. The fog of uncertainty in which most business and industrial leaders functioned in respect to certain new restricting conditions is being dissipated. There is emerging a marked ability to adjust to prevailing conditions, to move ahead despite handicaps.

For example, in discussing the successful conduct of labor relations, J. H. Goss, vice president, Scovill Mfg. Co., Waterbury, Conn., cited the need for a new type of expert, the human engineer—that is, an expert in understanding and controlling human emotions. He described the benefits that come from the application of such specialized ability.

## Wages and Social Equality Are Fundamental Desires of Workers

"While wage earners have many desires, only two are fundamental," said Mr. Goss. "One of these is for as much compensation as he or she can get. The other is the privilege of meeting, without embarrassment and on an equal plane with the top executive of the company. When these primary desires are gratified the others present little difficulty.

"The men are fond of playing jokes on each other and those who are deficient in a sense of humor become the targets of the others. This same disposition is reflected when they meet with the boss. They are eager to see what the old man will say and how he will act. They are curious to find out if he 'can take it.'

"A great deal of patience and self-control, as well as a sense of humor are required if the boss is to sell himself to his men. They know very well that the right to collective bargaining—I prefer to call it collective negotiation—is guaranteed to them under the law. An executive cannot afford to lose his temper, be abrupt or say 'no' without due consideration.

## Wide Opportunity Is Opening up For Ambitious Junior Executives

"If the top executive does not have the requisite qualifications, the job of dealing with employes must be delegated to an executive adequately equipped. If a company has no executive so equipped it is just too bad."

It is an old axiom that every problem is difficult only until it has been solved. Industrial executives a quarter of a century hence will allude to the present era as the good old-fashioned days.

Present conditions provide unusual promise for ambitious junior executives and other bright young men in industry. They will do well to think beyond their present jobs. Those who train themselves to assume the burdens that will devolve on the top executives of the future will find plenty of room at the top.

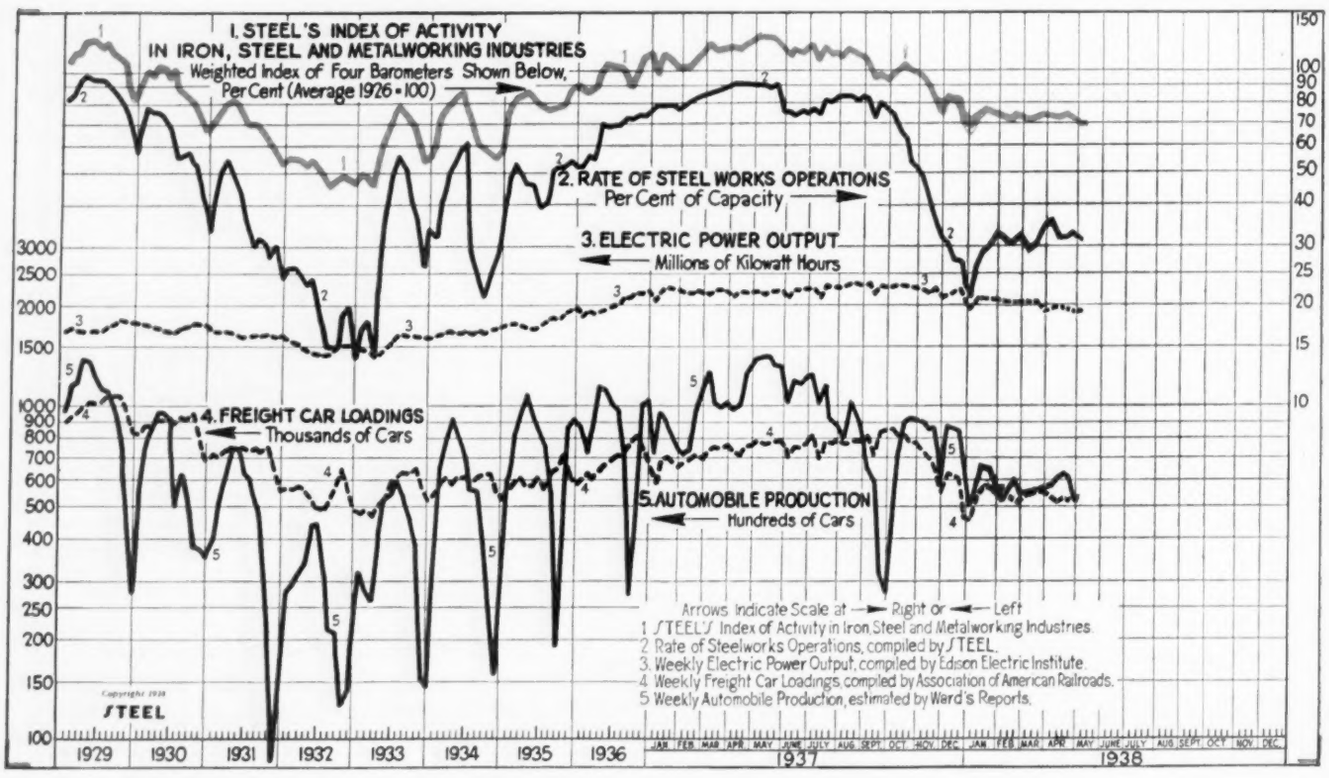
# THE BUSINESS TR

## Trend of Activity Remains Uncertain

■ INDUSTRIAL activity in the iron, steel and metalworking industries continues listless, with STEEL's index showing a small gain of 0.3 point to 68.7 per cent in the week ended May 7. Fluctuations of the principal barometers composing the index were of minor importance.

Steelmaking operations receded to 31 per cent of capacity in the week ending May 7. This represents a decline of one point from the previous week and reflects a continuation of the easier tendency which developed in April.

The other barometers composing STEEL's index registered slight gains in the week ended May 7. The most marked advance was noted in automobile assemblies, caused by the resumption of operations at some assembly plants formerly harassed by labor disturbances. Production mounted to 53,385 units compared with 50,755 in the week ended April 30. Revenue freight car loadings remained under the 550,000 car bracket but registered a slight gain to approximately 547,000 cars. Power output also showed a small gain in the week ended May 7, but failed to break through the 1,940,000 kilowatt-hour level.


1. STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below,
Per Cent (Average 1926 • 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at → Right or ← Left
1 STEEL'S Index of Activity in Iron Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL.
3 Weekly Electric Power Output, compiled by Edison Electric Institute.
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
Copyright 1938 STEEL
1929 1930 1931 1932 1933 1934 1935 1936
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC 1937
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC 1938

*STEEL'S index of activity gained 0.3 points to 68.7 per cent in the week ended May 7:*

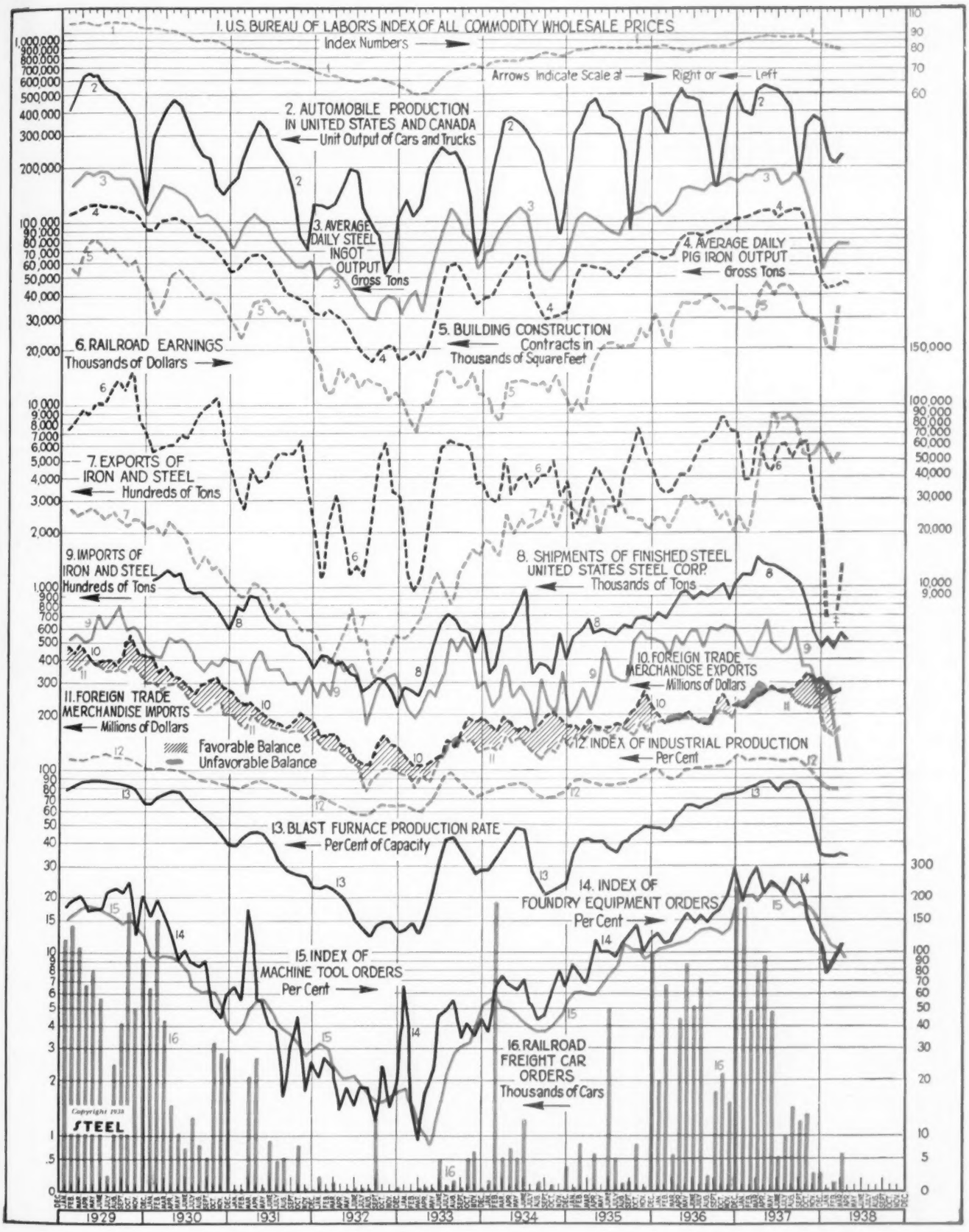
| Week ending | STEEL'S Index of Activity Index No. 1938 | 1937 | Steelworks Operating Rate Per Cent 1938 | 1937 | Electric Power Output Million KWH 1938 | 1937 | Freight Car Loadings 1938 | 1937 | Weekly Auto Output 1938 | 1937 |
|---|---|---|---|---|---|---|---|---|---|---|
| Feb. 5 | 70.9 | 100.8 | 31.0 | 79.5 | 2,082 | 2,201 | 564,740 | 675,026 | 51,443 | 72,295 |
| Feb. 12 | 71.2 | 101.9 | 30.0 | 81.0 | 2,052 | 2,199 | 542,991 | 691,618 | 57,810 | 72,850 |
| Feb. 19 | 71.9 | 108.8 | 31.0 | 83.0 | 2,059 | 2,211 | 535,790 | 714,884 | 59,100 | 95,698 |
| Feb. 26 | 70.3 | 112.8 | 30.5 | 84.0 | 2,031 | 2,207 | 511,930 | 696,727 | 56,977 | 111,915 |
| Mar. 5 | 70.1 | 117.9 | 29.5 | 86.0 | 2,035 | 2,199 | 552,916 | 734,127 | 54,440 | 126,975 |
| Mar. 12 | 70.8 | 112.7 | 30.0 | 87.0 | 2,014 | 2,212 | 556,664 | 748,993 | 57,438 | 101,684 |
| Mar. 19 | 71.3 | 113.1 | 32.0 | 89.0 | 2,017 | 2,211 | 540,332 | 759,269 | 57,555 | 99,013 |
| Mar. 26 | 72.4 | 114.0 | 35.0 | 90.0 | 1,975 | 2,200 | 572,952 | 761,109 | 56,800 | 101,046 |
| Apr. 2 | 72.0 | 112.0 | 36.0 | 91.5 | 1,978 | 2,146 | 523,489 | 726,687 | 57,500 | 97,005 |
| Apr. 9 | 71.3 | 112.8 | 32.0 | 91.5 | 1,990 | 2,176 | 521,978 | 716,044 | 60,975 | 99,196 |
| Apr. 16 | 71.4 | 119.6 | 32.0 | 91.5 | 1,957 | 2,173 | 537,595 | 751,328 | 62,021 | 125,472 |
| Apr. 23 | 70.8 | 122.0 | 32.5 | 91.5 | 1,951 | 2,188 | 523,767 | 761,182 | 60,563 | 133,164 |
| Apr. 30 | 68.4 | 123.9 | 32.0 | 91.0 | 1,938 | 2,193 | 543,075† | 782,423 | 50,755 | 139,475 |
| May 7 | 68.7* | 123.5 | 31.0 | 91.0 | 1,939 | 2,176 | 546,876* | 767,481 | 53,385 | 140,188 |

*Preliminary. †Revised.

# STREND

| Key: | March, 1938 | Key: | March, 1938 | Key: | March, 1938 | Key: | March, 1938 |
|---|---|---|---|---|---|---|---|
| 1 | 79.7 | 5 | 34,055,000 | 9 | 11,827 | 13 | 33.4* |
| 2 | 236,300 | 6 | 14,470,444‡ | 10 | 275,711,000 | 14 | 114.6 |
| 3 | 74,045* | 7 | 526,833 | 11 | 173,405,000 | 15 | 91.0* |
| 4 | 46,267* | 8 | 501,972* | 12 | 79.0 | 16 | 680 |

*April. ‡Deficit of $2,136,481 in February not shown on chart.




Key: 1. U. S. Bureau of Labor's Index of all Commodity Wholesale Prices. 2. Automobile Production in United States and Canada, compiled by U. S. Department of Commerce. 3. Average Daily Steel Ingot Output, compiled by American Iron and Steel Institute. 4. Average Daily Pig Iron Output, compiled by STEEL. 5. Building Construction, Contract Awards in 37 States, compiled by F. W. Dodge Corp. 6. Railroad Earnings, Net Operating Income for Class I Roads, compiled by Bureau of Railroad Economics. 7 and 9. Iron and Steel Foreign Trade, reported by Bureau of Foreign and Domestic Commerce. 8. Shipments of Finished Steel, United States Steel Corp. 10 and 11. Foreign Trade, Value of Exports and Imports, reported by Bureau of Foreign and Domestic Commerce. 12. Index of Industrial Production (adjusted for seasonal variation; average 1923-25=100) computed by Federal Reserve Board. 13. Blast Furnace Production Rate, compiled by STEEL. 14. Index of Foundry Equipment Orders (Average 1922-24=100), compiled by American Foundry Equipment association. 15. Index of Machine Tool Orders (Three-month moving average; average monthly shipments 1926=100), compiled by National Machine Tool Builders association. 16. Railroad Freight Car Orders, compiled by STEEL.

# COLD FORGING

**This process has made great progress in the past five years due to development of improved machinery. Many products and parts now are produced by cold heading wire**

■ ALTHOUGH long in existence, particularly in production of rivets and bolts, the cold forging process has made its greatest advancement during the past five years. This has resulted from the development of greatly improved cold forging machinery. Cold forging machines now are in use in the production of a wide range of products including typewriter pawls, tubular rivets, hexagon nuts, all types of machine screws, all types and shapes of bolts, machine parts, balls for bearings, valve lifters, contact points, clock and watch parts and many automotive parts.

The cold forging process also is being used increasingly in the manufacture of many products which cannot be finally formed by upsetting. These products are upset or headed in cold forging machines and then subsequently machined. The combination of the two methods is found economical in an ever-increasing number of cases.

Main advantage of the cold forging process is that it produces little scrap. Cold forging machines operate mainly on wire, rods and bars. Scrap consists of wire ends, trimmings and shavings and averages about 4 per cent of material purchased. Other advantages are uniformity of product within commercial tolerances, high speed production, minimum floor space per unit of production and forming of surfaces free of scale. Another advantage claimed is that cold working increases the strength of most metals.

### Applied to Wire

At present the process is being applied to wire having diameters up to 1½ inches. As an example of the finer diameters now being worked, 0.025-inch steel rivets are being produced. Another illustration is a steel typewriter rocker arm pin made from 0.061-inch wire. This part, in a new cold heading machine developed by E. J. Manville Machine Co., Waterbury, Conn., is produced at the rate of 4000 per hour. The process is useful in producing parts with projections, since heads or collars may be upset wherever desired within broad limitations.

Present standard machines are designed for single, double, triple and 4-blow operation. Selection of the machine depends on the shape of the finished product and also on whether it is necessary to anneal between operations. The triple and 4-blow machines usually are selected only for products that do not require annealing between upsets. In all cases the die must be designed for the particular job. The process may be used with any metal or alloy that can be cold worked. Headers operate with open or closed dies. The open die is used for comparatively long work on which the parting line produced on the shank by the dies is not objectionable. Conversely, solid dies are recommended for shorter work where greater accuracy and higher finish of shank are required.

Typical parts made on 2 and 3-blow cold headers and supplementary equipment, at the plant of the Lamson & Sessions Co., Cleveland, are shown in Figs. 8 and 9.

Fig. 9 shows the different stages in forming a special part. Initial operations are on a 3-blow header. The first sample is the wire blank cut to length. The second sample shows

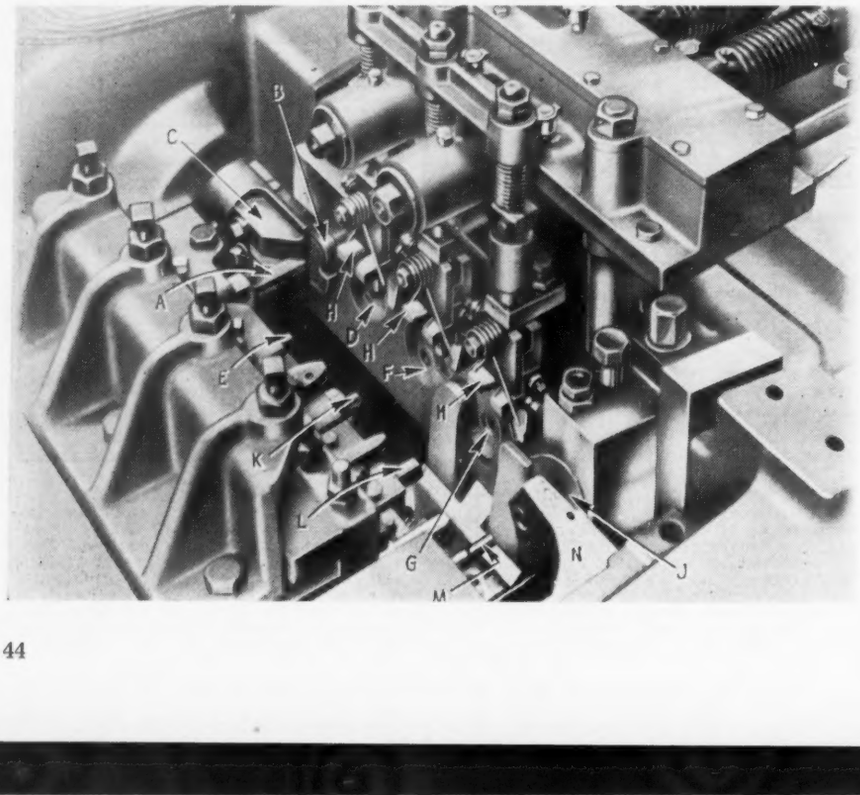



**Fig. 1—Details of Waterbury Farrel automatic nut former are shown in this view. In five stands this machine cold heads hexagon nuts from round wire at rate of 80 to 100 pieces per minute depending on size**

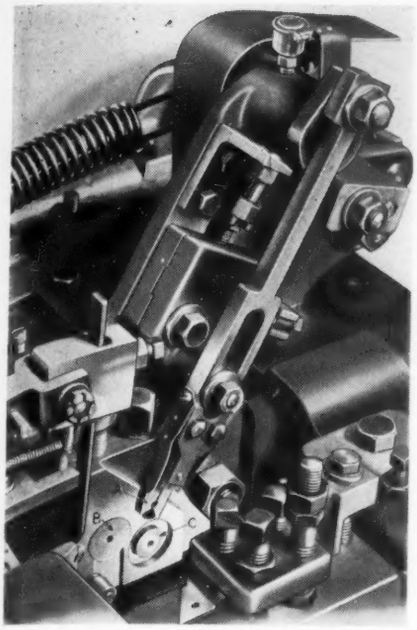


Fig. 2—This Waterbury Farrel solid-die, double-stroke, toggle header makes tubular rivets without the usual subsequent drilling operation. Transfer mechanism with spring fingers A carries work from one die to the other during shifting of the punch slide. Dies are shown at B and C

the effect of the first blow in extruding to shank diameter. The third sample shows the effect of the second blow which makes the first upset and extrudes the section to be roll threaded. The fourth sample shows the effect of the third blow in making the second upset. The piece then is annealed. The fifth sample shows the head formed in a reheader. The sixth sample shows the head trimmed.

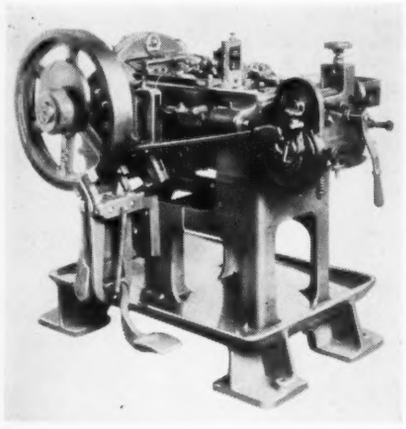


Fig. 3—This Manville solid-head, double-stroke header makes tubular rivets without subsequent drilling. It employs one set of tools for the entire operation which requires two blows

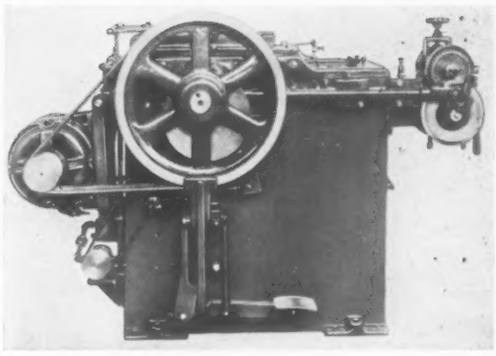


Fig. 4 — Steel balls for bearings are cold headed at high speed in this Manville machine. The finished blanks are held within close tolerances and require less than the usual amount of finish grinding

The seventh sample shows the part completed with rolled thread. As indicated, upsetting the head for this part requires three blows.

Fig. 8 illustrates the stages in forming a brass machine bolt, employing a 2-blow header, an automatic trimmer and an automatic thread roller. First sample shows the wire blank cut to length. The second sampie shows the first upset as well as the extrusion of that portion which will be roll threaded. The third sample shows the second upset. The fourth sample shows the blank after trimming in the automatic trimmer. The fifth sample shows the finished part after threading on an automatic thread roller. In this part the head is upset in two blows.

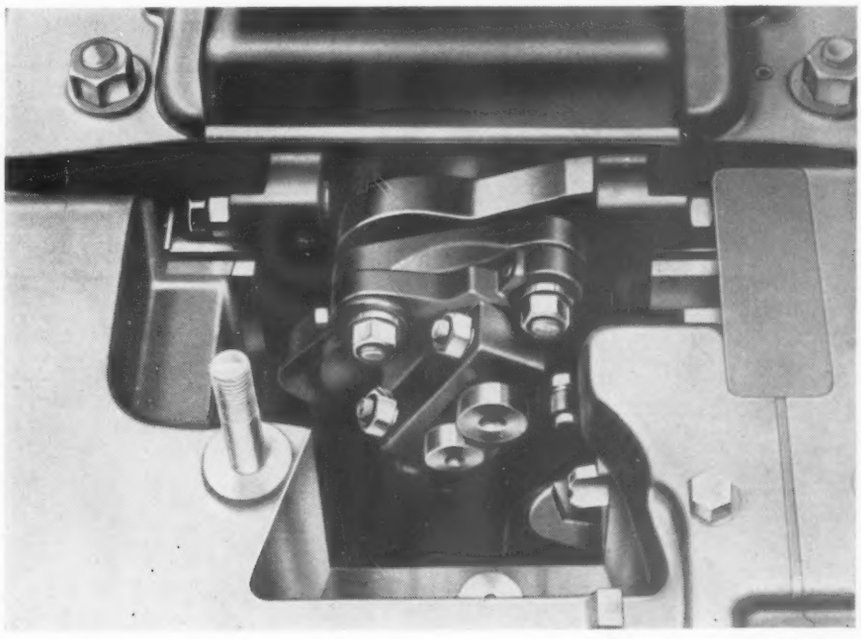
### Utilize Transfer Headers

Now coming into wide use in the manufacture of machine bolts and cap screws are new transfer headers built by Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., and National Machinery Co., Tiffin, O. Including the cut-off, the new progressive header is a multi-station machine consisting of a series of dies and a series of punches. The operation consists of cutting off the wire, forming a conventional cone, finishing the head, extruding to the proper diameter for thread rolling and trimming the head to the desired shape. In operation the machine really is a single-blow header, the work being transferred from die to die until at the final operation it is dropped from the machine and is ready for the thread roller. In other words, at each stroke of the machine a headed, extruded and trimmed blank is produced.

Introduction of transfer or multiple-station headers has simplified the manufacture of many articles which formerly required either heading or reheading or an entirely different process of manufacture.

An interesting special application of the cold heading art is the automatic nut former introduced by Waterbury Farrel for the manufacture of hexagon nuts from round wire. The only scrap produced is a portion of the metal originally occupying the

Fig. 5—Looking rearward in the die box of a National double-blow, solid-die, cold header, showing the oscillating heading tool bolster



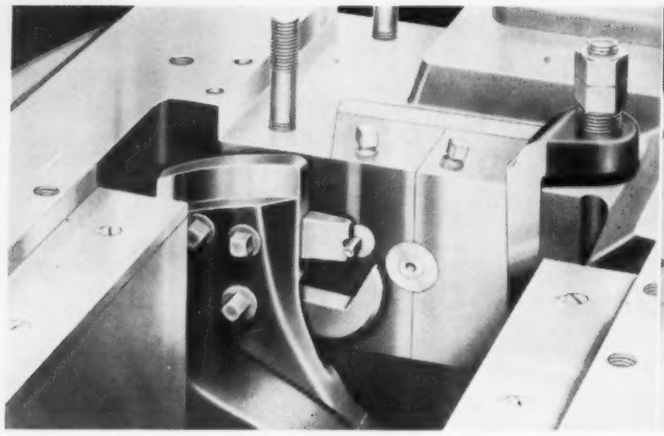


Fig. 6—Looking forward in the die box of a double-blow, solid-die, cold header, showing the cutter about to engage the wire and cut off a blank

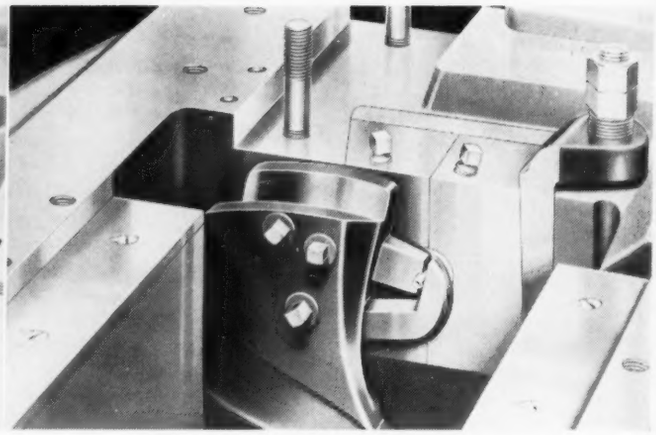


Fig. 7—Looking forward in the die box of a double-blow, solid-die, cold header. As the cutter starts to move across the wire, the finger comes in contact from the opposite side and holds the blank while it is being transferred to the heading stage

hole in the nut. This is a 5-station machine on the order of the progressive header. The scrap loss varies from 13 to 25 per cent of the original metal, depending on the size of the nut. Production ranges from 80 to 100 nuts per minute, also depending on the size of the nut.

Mechanical sequence in this automatic nut former is illustrated in the close-up view of tools and transfer head shown in Fig. 1 and by the samples shown in Fig. 10. Wire is fed against an adjustable wire stop A where it is cut off to length. The blank is held in the spring finger cut-off knife B while being transferred by the movement of cut-off bar C into line with die D and square-up punch E.

Simultaneously with this movement, the blank already in die D and those in the third and fourth dies F and G are ejected into transfer fingers H at each of the three stations and carried in succession to the next operation die. This brings the chamfered and recessed blank into line with the last or piercing die J. The first and second forming punches are indicated, respectively, at K and L.

It will be understood that at each station a blank is forced from its transfer fingers, or from knife B, and into a die by pressure of one or various punches. The pierced blanks are stripped from punch M, as the gate recedes, by stripper N. The blanks fall into a delivery tube leading to a receptacle near the operator's station and the punchings into another tube leading to a scrap box. Thus the nut blanks are delivered free from scrap and ready to go directly to the tapping machine.

Another interesting Waterbury Farrel development is a tubular rivet header. This is a solid-die, double-stroke, toggle header which makes tubular rivets without the usual subsequent drilling operation. It employs one set of tools for making the head in two blows and an additional set for forming the tubular portion, both sets working simultaneously on successive rivet blanks. The special equipment, as shown in Fig. 2 includes also a transfer mechanism with spring fingers A by means of which the work is carried from one die to the other during the shifting of the punch slide. The two dies are shown at B and C.

An interesting development by E. J. Manville Machine Co. is the tubular rivet header shown in Fig. 3. This is a solid-die, double-stroke header which makes tubular rivets at high speed without the usual subsequent drilling operation. It employs one set of tools for the entire operation which requires two blows.

Another recent Manville development, shown in Fig. 4, is a new header for making steel balls for bearings. Wire is fed in from a coil, cut off, headed and dropped out as a ball, all in a single machine. Capacity includes balls from ⅛ to 1-inch in diameter. When working on ⅛ or 7/32-inch balls production averages 350 per minute. Considering the size of the ball, unusually high speed has been achieved with another adaptation of this machine which produces 5/16-inch balls at 300 per minute. Balls shaped by the new header are said to require about 50 per cent less than the usual amount of finish grinding. This is because the finished blanks are kept within extremely close tolerances.

Typical new type machines are the single and double-blow cold headers recently introduced by National Machinery Co., Tiffin, O. In these machines a short, compact, steel bed frame of cabinet construction, having heavy transverse and longitudinal ribbing, reduces spring to a greater degree than before. In the 2-blow machines the conventional means of transferring the heading tools from the coning to the finishing stage has been discarded in favor of an oscillating type toolholder which rocks back and forth about a fixed center on a large diameter shaft.

The National cut-off mechanism has been simplified through adoption of an oscillating cutoff and carry-over arm which rocks on a station-

Fig. 8—This brass machine bolt was formed in a 2-blow cold header, an automatic trimmer and an automatic thread roller. In this operation the head is upset in two blows

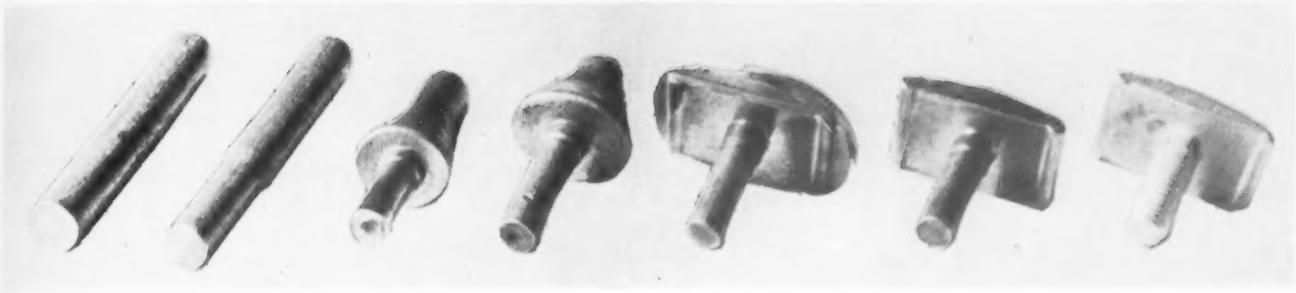


**Fig. 9—This special part is formed in three blows on a 3-blow header. Following annealing the head is formed in a reheader. Then the head is trimmed and the thread rolled**

ary pin of large diameter. A mechanically-operated gripper finger securely holds the blank while it is being transferred from the cut-off stage to the heading line. As soon as the blank is engaged by the heading tool the fingers back away from the work, thus eliminating any chance of marring or scoring the blank. These features permit higher operating speed with less vibration. They increase the life of dies and permit work to be held to closer tolerances. Use of antifriction bearings, with a full automatic cascade oiling system and fully enclosed working parts, are additional improved features.

Some features of the improved National open die header are of special interest. A separate cam controls a toggle which permits one-half of the split die to open a slight amount so that long work easily can be fed into the die and easily ejected. During the upsetting portion of the stroke the die is securely closed, resulting in almost total absence of part line fin under the head. On some long work this machine is operated as a solid die machine by simply turning a screw which securely holds the dies in the closed position and throws the actuating mechanism out of operation. In fact, when the gripping mechanism is thrown out of operation this machine can be equipped with solid dies exactly like the conventional solid die cold header. Figs. 5, 6 and 7 show die box details of a National double-blow, solid-die cold header.

Coincidental with the development of newer and faster headers has been the development of newer and faster secondary machinery, consisting of bolt head trimmers, screw thread rollers, screw pointers and thread cutting machines.

**Fig. 10—The first five samples of cold forged nut produced by Lamson & Sessions Co. represent the steps in the automatic nut former shown in Fig. 1. The sixth sample shows the nut after processing on an automatic tapper**

## Extended Plating Course By Mail Now Available

■ Dr. C. B. F. Young, Box 292, Flushing, Long Island City, New York, announces the second half of a complete course on electroplating is now available to students outside the New York area. Lecture notes are devoted to the theoretical considerations while the practical application of principles involved is studied in a series of laboratory experiments, complete equipment for which is supplied.

If the student has had a good course in chemistry, this course may be taken direct. If not, a special course is provided where the student can obtain the fundamentals of chemistry as applied to electroplating.

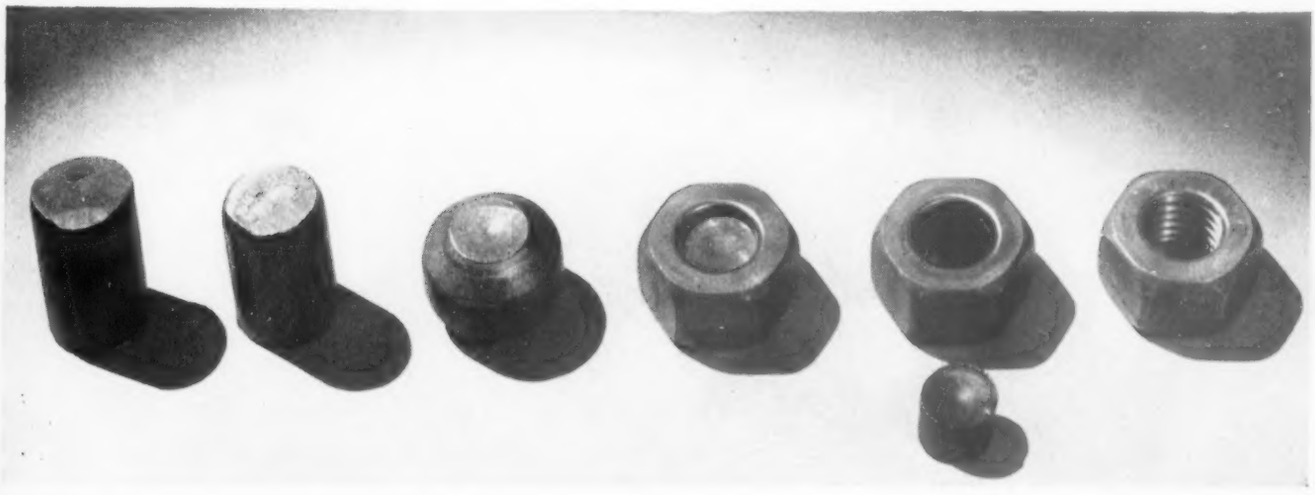
Experiments include deposition of copper, nickel, tin, zinc, cadmium, chromium, silver and brass from aqueous solutions and also anodizing and coloring aluminum.

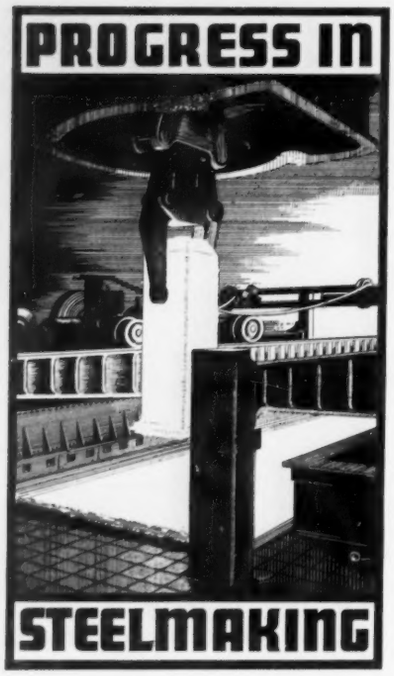
## Brochure on Hot-Tinning Methods Now Available

■ Practical details of methods employed in tinning metal articles of all descriptions are given in a new publication of the International Tin Research and Development Council. "The Hot-Tinning of Fabricated Articles" is the title of this brochure by E. J. Daniels which is derived from a survey of the patent, scientific and technical literature on the subject. References are given to the original published source of the information.

Degreasing, pickling and fluxing of the articles prior to the actual tinning are discussed and formulae are given for the baths suitable for the varying types of articles. These include articles made of copper and steel such as tubes, hollow-ware and wires, and also cast iron.

The difficulties met in tinning brass, bronze and aluminum necessitate special treatments for these metals.






# Refractory Arches

**The second part of this paper, presented here, shows how to figure number and type of standard brick to use to make a wide variety of refractory arch constructions**

PART II

By J. SPOTTS McDOWELL
and
L. L. GILL
Harbison-Walker
Refractories Co.
Pittsburgh

■ THRUST OF AN ARCH against the skewbacks depends primarily upon the weight of the brick and the rise of the arch, and secondarily, upon the temperature of the furnace. For a furnace which has not been heated, the vertical thrust $F_v$ on the skewback at each end of a ring course of brick is equal to one half the weight of that course = W/2. The horizontal thrust may be computed approximately by the following formula:

$$F_h = \frac{3}{p} \times \frac{W}{2}$$

$F_h$ = horizontal thrust against the skewback at each end of a ring course of brick; or the horizontal thrust at the center of the arch.
p = the rise of the arch in inches per foot of span.
W = the weight of a ring course of brick.

As an example, let the rise per foot of span be 2 inches, and let the weight of a course of brick be 200 pounds. Then the horizontal thrust

$$F_h = (3 \div 2)\ (200 \div 2)$$
$$= 150 \text{ pounds}$$

It should be noted that this is not the thrust in pounds per square inch, but is the total horizontal thrust against the skewback at one end of a course of brick.

The total resultant thrust $F_r$ against the skewback is equal to the square root of the sum of the squares of the horizontal and vertical components; that is,

$$F_r = \sqrt{F^2_h + F^2_v}$$

In the above example, the total resultant thrust is:

$$F_r = \sqrt{150^2 + 100^2}$$
$$= 180.3 \text{ pounds}$$

When a furnace is heated, thermal expansion of the arch brick occurs. Usually, no compensation is made for this expansion. Consequently, the arch must rise, and there is a tendency toward pinching of the interior ends of the brick. However, in the operation of some types of furnaces, especially those in which the roofs have a low rise and are built of silica brick, it is found advantageous to compensate for thermal expansion by adjustment of tie-rods or by other means.

### Thrust Increased Upon Heating

If full compensation is not made, expansion of the roof brick will alter the position of the center of stress and the angle of thrust, and will increase the amount of thrust by an indeterminate amount. The magnitude of the thrust will be affected also by the manner in which the arch has been built initially, and later may be increased by the weight of slag or other material absorbed by the roof brick in service. For

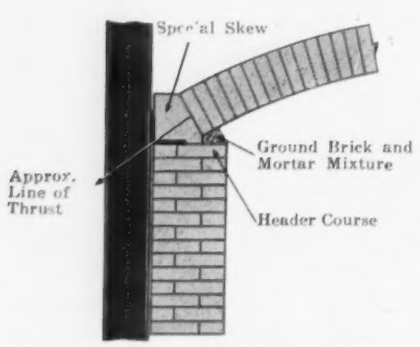



Fig. 8—Special skewback. A recommended construction

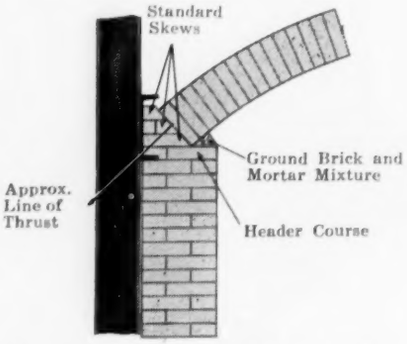



Fig. 9—Built-up skewback. This construction is recommended

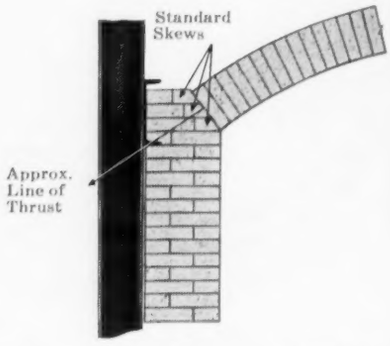
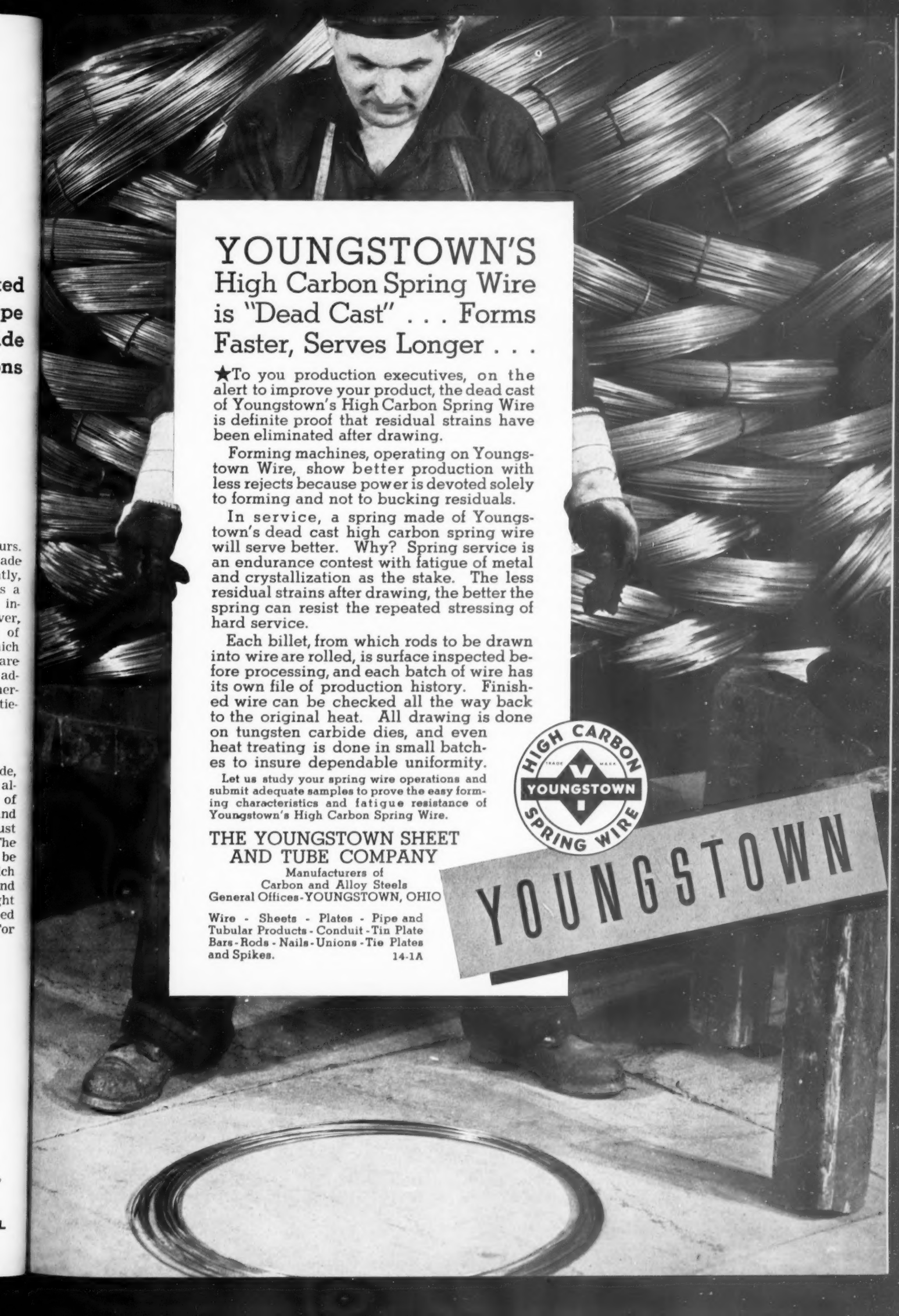



Fig. 10—Another type of built-up skewback

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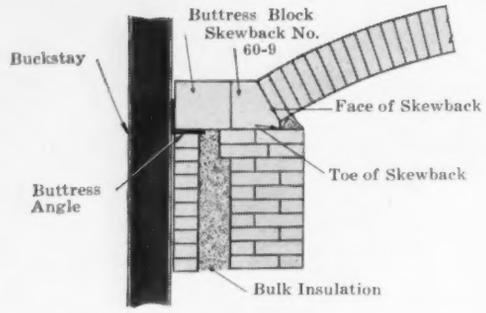



**Fig. 11—A 60-degree skewback with buttress block**

calculations affecting the design of the furnace binding, the arch thrust at operating temperatures is approximated by multiplying the calculated cold thrust by an arbitrary factor. Logically, the value of this factor should depend upon the ratio of rise to span of the arch. The following factors are suggested tentatively. In an arch with a very low rise, as for example 1 inch per foot of span, the thrust will be considerably greater than that calculated by use of the factor, unless compensation for thermal expansion is made. It may be great enough to produce excessive stresses on the skewback and buckstay system.

## Table I
## Stress Factor for Various Rises

| Rise in inches per foot of span | Stress factor |
|---|---|
| 3 | 2 |
| 2.5 | 2 |
| 2 | 2.25 |
| 1.608 | 2.75 |
| 1.5 | 3 |
| 1 | 3 |

In such calculations, frictional resistance between the skewbacks and the underlying brick masonry is disregarded.

Skewback brick rarely fail by compression. If the compressive forces become excessive, failure is more likely to occur in the arch than in the skewback.

End-supports or abutments of a roof arch serve to transmit the arch stresses to the buckstays and tie-rods. An abutment consists of two parts: First, the brick skewback; and second, a horizontal steel member or "buttress" which supports the skewback. The buttress may be either a channel, an angle or an I-beam. It is protected from the effects of excessive temperature by the brickwork. The abutments must not only support the static weight and cold thrust of the arch, but they also must withstand the additional stresses due to thermal expansion of the roof brick.

Solid support for both the horizontal and the vertical components of the arch stresses is vitally important. Movement of the skewbacks (other than that necessary to accommodate thermal expansion of the arch brick), is probably one of the most common mechanical causes of arch failure. This movement may result from softening or wearing away of sidewalls upon which the skewbacks rest, insufficient strength or rigidity of the metal binding, overheating of the binding, or defective or inadequate foundations.

Skewback brick should be protected from the destructive influence of furnace conditions. Wearing away of the skewbacks through slag attack or other causes may cause failure of the roof. Softening of the hot face of the wall upon which the skewbacks rest may cause sagging or tilting of the skewbacks, with resultant changes in the radius of the arch; an endeavor should be made to maintain the original curvature of the roof. As a general rule, skewback brick should not be separated from the metal buttress by insulating brick or insulating refractory brick, as these may crush through inability to support the arch stresses, and thereby deprive the skewback of its necessary support.

Skewbacks should always be neatly and accurately fitted and set in place with full bearing to assure maximum life of the roof. The skewback brick should be set in such position that its toe is not subjected to destructive influences. It must be kept level and solidly supported.

When sidewalls of a furnace are not subjected to erosion by slags, or to other influences which cause erosion or softening, the skewback brick require no special protection, and can be placed with the toes flush with the inner faces of the walls. However, skewback brick so placed may be deprived of their support and the arch fail, if the inner wall faces soften or wear away. Moreover, any sagging of the face of the wall which causes the skewbacks to tilt, will change the radius of the arch and may cause it to buckle.

### Skewback Protected

With the construction shown in Fig. 8, in which the wall is thicker than the arch, the skewback is in a protected position, and damage to the interior face of the wall will not affect the skewback. The special skewbacks shown as Figs. 5, 6 and 7 in the first installment of this paper, can be used for constructions in which the walls are 4½ inches thicker than the roofs. Under this condition, a 4½-inch roof will rest on 9-inch sidewalls, a 9-inch roof on 13½-inch sidewalls, and a 13½-inch roof on 18-inch sidewalls. At times it may be preferable to use a 12-inch roof on sidewalls 18 inches thick.

Accompanying drawings illustrate a few important principles in skewback design and placement. Figs. 9 and 10 illustrate a 9-inch arch, resting on a 13½-inch wall and supported by a built-up skewback formed of standard brick. In Fig. 9, the preferable arrangement, the skewback is placed on the outer or cooler portion of the wall in such a manner that softening or wearing away of the inner 4½ inches of the hot face of the wall will not deprive the arch of its support. Repairs can be made to the inner 4½ inches of the wall without disturbing the arch. In Fig. 10, the skewback is so placed that softening or wearing away of the hot face of the wall may cause the skewback brick to separate and thereby affect the stability of the roof.

When there is a narrow ledge on top of the sidewall, as shown in Fig. 9, the space between it and the arch sometimes is filled with feather-edge or other brick. Since these

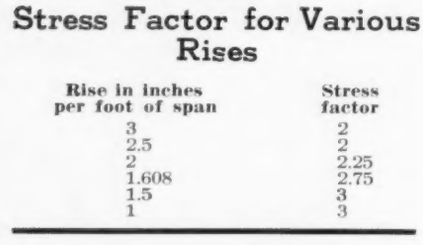



**Fig. 12—Special skewback, a construction used occasionally**

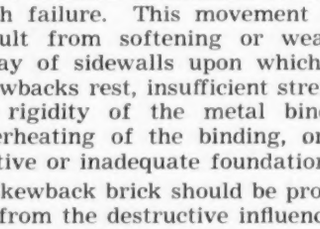


**Fig. 13—This special skewback construction is to be avoided**

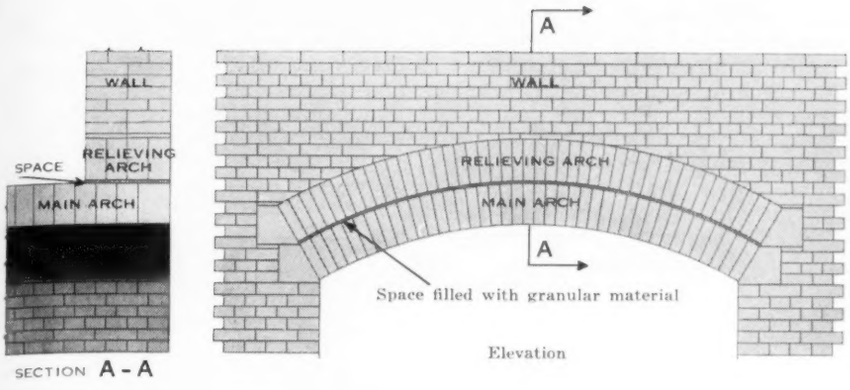



**Fig. 14—This illustrates use of relieving arch to support wall**

may fall off, it is usually better practice to fill the space with a mixture of ground brick and bonding mortar.

In Figs. 8, 11 and 12, special skewbacks are employed. In each case, the skewback is placed on the cooler part of the wall and is thereby protected. However, in Fig. 12 the special shapes between the skewback block and the ends of the arch may be damaged by any wearing away of the wall and the arch thereby weakened. The construction shown in Fig. 13, in which an arch is sprung from a corbel, is to be avoided since damage to the wall or corbel may result in destruction of the arch.

### 60° Skewbacks Recommended

In many cases, the furnace designer can plan the refractory structure to permit the use of the one-piece 60-degree skewback shapes illustrated in Figs. 5, 6 and 7 in the first installment of this paper. These shapes are of course special, and are not carried in stock. However, should the demand for such shapes become sufficiently great, they may ultimately be adopted as standards and be carried in stock by the manufacturers.

In general, arches covering flues do not have as wide spans as do roof arches, and usually the temperatures to which they are exposed are lower. The skewbacks may be either built-up combinations of standard sizes or one-piece special shapes. Usually, the 60-degree arch can be used and skewbacks of the design shown in Fig. 5 are suitable.

The term "wall arches" can be used to designate relieving arches, and arches over firing door and charging door openings, ports and the like. The rise of wall arches can safely be made higher than that of roof arches, because the tendency to buckle outward is resisted by the weight of the overlying brickwork. Consequently wall arches are frequently made semi-circular; in other words, with a rise of 6 inches per foot of span.

In furnaces operated at high temperatures, it is often advantageous to span an opening through a wall with two or more sprung arches one above the other. The lower arch serves to withstand the brunt of the severe furnace conditions, while the upper or relieving arches support the weight of the wall, and facilitate repairs and renewals to the lower arch. This construction is illustrated in Fig. 14. If the relieving arch is to serve its purpose, it must be sprung separately and not merely laid upon the other arch. Therefore, it is desirable to provide a small space between the two arches. The width of the space, which should be filled with mortar, will depend upon the span and upon the operating temperature of the furnace.

Sometimes, to take care of the expansion of the brick in a wall arch, a vertical expansion joint is provided in the wall a short distance from the arch. When this is done, the skewbacks move outward as the arch brick expand due to heating; but they do not return to their original positions when the furnace cools and the arch brick contract. Hence, cooling the furnace may cause the arch to sag. It usually is better practice to omit the vertical expansion joint in such cases, even though doing so will lead to rising

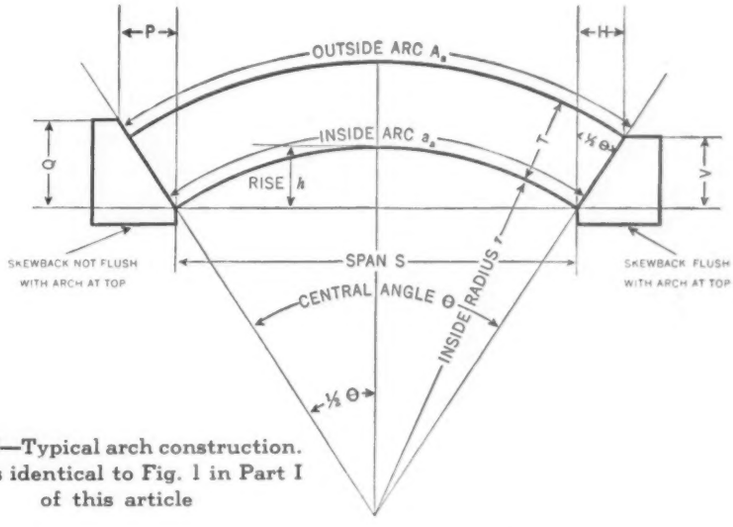



**Fig. 15—Typical arch construction. This is identical to Fig. 1 in Part I of this article**

## Table II. Arch Constants for Various Rises

| Rise in Inches Per Foot of Span | Inside Radius (r) | Central Angle (Θ) | | Inside Arc ($a_o$) | Difference Between Outside and Inside Arcs ($A_o - a_o$) | Skewback | | |
|---|---|---|---|---|---|---|---|---|
| | | Degrees | Part of Circle | | | H | V | P |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 1″ | 1.54167 S | 37° 50.9′ | 0.10514 | 1.01840 S | 0.66059 T | 0.32432 T | 0.94595 T | 0.34286 Q |
| 1¼″ | 1.25208 S | 47° 4.4′ | 0.13076 | 1.02868 S | 0.82157 T | 0.39933 T | 0.91681 T | 0.43557 Q |
| 1½″ | 1.06250 S | 56° 8.7′ | 0.15596 | 1.04117 S | 0.97992 T | 0.47059 T | 0.88235 T | 0.53333 Q |
| 1.608″ | 1.00000 S | 60° 00.0′ | 0.16667 | 1.04720 S | 1.04720 T | 0.50000 T | 0.86603 T | 0.57735 Q |
| 1¾″ | 0.93006 S | 65° 2.5′ | 0.18067 | 1.05579 S | 1.13519 T | 0.53760 T | 0.84320 T | 0.63757 Q |
| 2″ | 0.83333 S | 73° 44.4′ | 0.20483 | 1.07251 S | 1.28701 T | 0.60000 T | 0.80000 T | 0.75000 Q |
| 2¼″ | 0.76042 S | 82° 13.4′ | 0.22840 | 1.09125 S | 1.43507 T | 0.65753 T | 0.75342 T | 0.87273 Q |
| 2.302″ | 0.74742 S | 83° 58.5′ | 0.23326 | 1.09544 S | 1.46563 T | 0.66896 T | 0.74329 T | 0.90000 Q |
| 2½″ | 0.70417 S | 90° 28.8′ | 0.25133 | 1.11200 S | 1.57918 T | 0.71006 T | 0.70414 T | 1.00840 Q |
| 2¾″ | 0.66004 S | 98° 29.7′ | 0.27360 | 1.13464 S | 1.71906 T | 0.75753 T | 0.65280 T | 1.16044 Q |
| 3″ | 0.62500 S | 106° 15.6′ | 0.29517 | 1.15912 S | 1.85459 T | 0.80000 T | 0.60000 T | 1.33333 Q |

NOTE (1): A rise of 1½″ per foot is obtained when the skewback is formed by standard 9″ Featheredges of the 2½″ series. A rise of 1.608″ (about 1⅝″) per foot is obtained when the included angle of the arch (Θ) is 60°. A rise of 2.302″ (about 2⅜″) per foot is obtained when standard 9″ side and end skews of the 2½″ series are used. The factors in the above tables are the following functions of Θ: Column 2, ½ cosecant ½ Θ; column 4, Θ divided by 360°; column 5, ½ cosecant ½ Θ times included radians; column 6, included radians; column 7, sine ½ Θ; column 8, cosine ½ Θ; column 9, tangent ½ Θ.

of the arch, and may cause some pinching at the inside ends of the arch brick.

**Arch Calculations**

For any arch in which the rise per foot of span is given in Table II, the calculations can be made very simply by the application of the constants shown. For example, let the given arch have a span of 6 feet and a rise of 2¼ inches per foot of span; and let the arch be constructed of some combination of standard 9-inch wedge brick of the 2½-inch series. Then, using the symbols shown in Fig. 15:

The span S=6'0"=72"
The rise h=2¼" x 6=13½"
The thickness T=9"

*To find the arch dimensions:*

Inside radius (r)=.76042 x 72=54.7502=4' 6¾" (See column 2 for factor)
Central Angle (⊖)=82° 13.4' (From column 3)
Part of circle (⊖°/360°)=0.22840 (From column 4)
Inside arc ($a_a$)=1.09125 x 72=78.5700"=6' 6.⁹⁄₁₀" (See column 5 for factor)
Difference between arcs ($A_a-a_a$)=1.43507 x 9=12.9156"=12 29/32" (See column 6 for factor)
Then, outside arc ($A_a$)=inside arc ($a_a$) + difference ($A_a-a_a$) = 78.5700 + 12.9156=91.4856"=7' 7½".

*To find dimensions of skewback:*

Assume that the skewback is flush with top of arch, as shown on the right in Fig. 15. Then, dimension H=0.65753 x 9"=5.9178"=5 29/32" (See column 7 for factor).
Dimension V = 0.75342 x 9" = 6.7808" = 6 25/32" (See column 8 for factor).

*To find the number of brick per course of arch.* It has been stated that standard 9 inch wedge brick of the 2½-inch series will be employed to form the arch. The dimensions of some of the brick which may be used are the following:

9" Straights—9" x 4½" x 2½"
9" No. 1 Wedge—9" x 4½" x (2½"—1⅞"); turns circle of 2' 3" inside radius
9" No. 2 Wedge—9" x 4½" x (2½"—1½"); turns circle of 1' 1½" inside radius

Since, as shown, the given arch has an inside radius of 4 feet 6¾ inches, and the No. 1 wedge turns a circle with inside radius of 2 feet 3 inches, it is obvious that the arch must be formed by some combination of 9-inch No. 1 wedge and 9-inch straights.

The outside arc of the arch, as shown above, is 91.4856 inches. The outside chord dimension of both 9-inch straights and 9-inch No. 1 wedge is 2½ inches. Therefore, the total number of brick per course is

$$91.4856 \div 2\tfrac{1}{2} = 36.59 \text{ or } 37.$$

The difference between the arcs, as shown, is 12.9156 inches. The taper of a 9-inch No. 1 wedge brick is 2½ inches − 1⅞ inches = ⅝ inch. Therefore, the number of 9-inch No. 1 wedge brick per course is

$$12.9156 \div \tfrac{5}{8} = 20.67 \text{ or } 21.$$

The number of 9-inch straights per course is 36.59−20.67=15.92=16.

*Note:* This method for determining the number each of two sizes of brick required to form one course of an arch, is applicable only when the sizes used have common outside chords, and when one brick is a straight, and the other is tapered or radial. When the brick have common outside chords, and both are radial, the quantities are calculated from the following formulas:

$$n_t = \frac{A_a}{C}$$

$$n_e = \frac{a_a - n_t c_f}{c_e - c_r}$$

$$n_f = n_t - n_e$$

To find the total number of brick per course ($n_t$): divide the outside arc ($A_a$) by the common outside chord dimension (C).

To find the number ($n_e$) or brick E (the brick which turns the larger diameter), multiply the total number of brick per course ($n_t$) by the inside chord dimension ($c_f$) of brick F (the brick which turns the smaller diameter) and subtract the product from the inside arc ($a_a$); divide the value so found by the difference between the inside chord dimensions ($c_e - c_f$) of brick E and brick F.

To find the number ($n_f$) of brick F: subtract ($n_e$) the number of brick E, from ($n_t$), the total number of brick per course.

## Time Study Applied to British Rolling Mills

■ *Application of Time Study to Rolling Mills*, cloth, 130 pages, 5¼ x 8¼ inches; published by Iron and Steel institute (British), London; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This is special report No. 20 of the Iron and Steel institute, the second report by the rolling mill committee. It was presented for discussion at the annual general meeting of the institute in London in May.

While the use of time study in heavy industries in Great Britain is in its infancy and its use relative to rolling mills has been confined to determination of bottlenecks between mill units this report describes a series of investigations made with the idea of extending the use of time study in iron and steel works.

A difficulty has been to determine a standard or measure of performance which would take account of all delays and stoppages and also differences in the output rate of various product types and sizes.

By applying standards based on time studies an efficiency index was established by means of which performances of each mill could be compared. The result of these observations is given in detail with tables and graphs to illustrate the text. Principles evolved are subject to further consideration and refinement and suggestions are made for better application than was possible in these tests.

## Graphic Charts as Aid To Enlarged Profits

■ *Graphic Routes to Greater Profits*, by John W. Esterline; tooled fabrikoid, 320 pages, 8½ x 11 inches, 450 illustrations; published by Esterline-Angus Co., Indianapolis; supplied by STEEL, Cleveland, for $3; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The theme of this publication is the effect of graphic instruments in increasing productive capacity and efficiency of industry. It is a book of experience rather than opinion and more than 250 case studies, each covering a distinct problem, give procedures followed, the graphic charts obtained and the solution reached.

An introductory section of 30 pages discusses the high cost of inefficiency, what graphical representation means and classification of industrial problems. The remainder of the book is in five sections, relating to problems of power, machines, processes, and men, research and special problems.

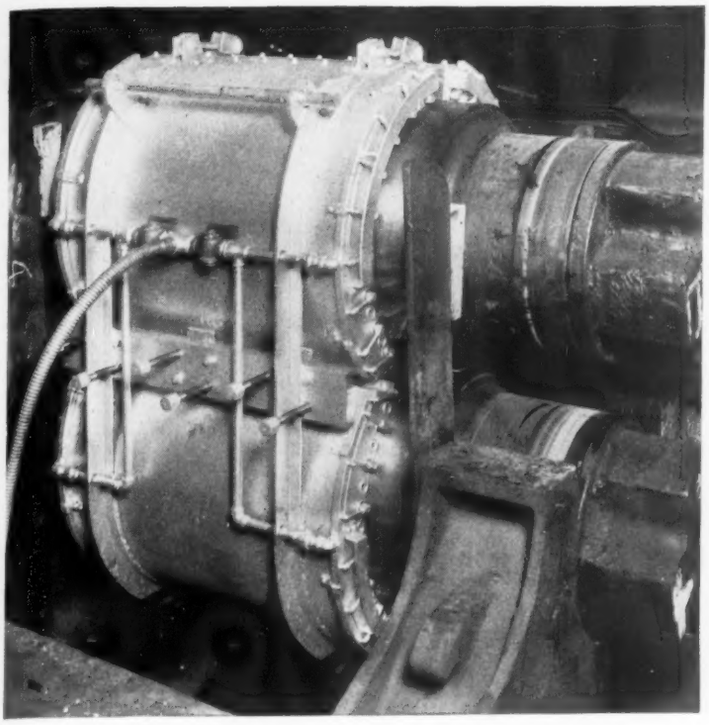
The volume is intended to be a practical contribution to the art of applying the scientific method to the conduct of industry. It discloses the modern technique of critical examination and diagnosis of industrial operations. The author has endeavored not only to impart information but to spur the reader to a continuous reappraisal of his methods and achievements.

## Discussion of Coal Published in Symposium

■ A symposium containing the significance of tests of coal has been published by the American Society for Testing Materials, 260 South Broad street, Philadelphia. The material is presented in detailed discussions through six technical papers prepared by outstanding authorities. In addition to the papers, the 132-page booklet embodies discussions of other technologists.

Following the paper on the interpretation of laboratory coal tests, proximate analysis and calorific value, there also is much discussion on the significance of sulfur in coal, ash softening temperature and ash composition in the utilization of coal. Laboratory tests relating to caking, plastic, gas and coke making properties of bituminous coals and the meaning of friability and size stability tests on coal are covered.

# Got an Old Envelope or Tablecloth Handy?



*(Or . . . never mind . . . we'll make ciphering space for you below).*

Reach for your pencil . . . the answer to this one is not in the back of the book. You'll have to figure it out for yourself.

Brass tacks on Radiatube, the new two-high roll-heater by Kemp of Baltimore: Six cubic feet of natural gas, or 12 cubic feet of coke oven gas, will do the work of one kilowatt hour of electricity. Calculate, over the week-end, what that means in dollars in your mill. Figure what it means over the year. Then reach for your phone, buzz for your secretary, or SOMETHING . . . get in touch. Address The **C. M. Kemp Mfg. Co., at 405 E. Oliver St., Baltimore Md., or Oliver Bldg., Pittsburgh, Pa.** for complete details on spectacular performance in cost cutting. Time-saving is just an extra bonus thrown in for good measure.

**KEMP of BALTIMORE**

# Special Tooling on Screw Machines May Lower Costs

■ SESSIONS dealing with gears and machine tools, foundry metals, inspection procedure, apprentice training, and shop practice, featured the national meeting of the machine shop practice division, American Society of Mechanical Engineers, at the Sagamore hotel, Rochester, N. Y., May 10-12. More than 125 members of the society and guests attended the four technical meetings and banquet.

The most essential part of operating machine tools efficiently is in using correct tools, declared E. W. Brinkman, sales engineer, Davenport Machine Tool Co., Rochester, in presenting a paper describing new methods in tooling automatic screw machines. Changes in tooling this class of machine have developed rapidly, particularly in the last five years, he said, through necessity for saving operating time, increased cost of machinery, and higher labor costs.

In many cases, too little study is given to tooling of individual jobs, it being not unusual for a manufacturer to purchase a high-priced machine tool because he feels it is necessary to control his product, and at the same time be unwilling to purchase additional equipment required to reduce cost of producing parts sometimes as much as 75 per cent. This situation exists, the speaker stated, despite the fact that the cost of additional equipment might be only a small item in proportion to the cost of the machine.

### Declines Extra Equipment

As an illustration, a manufacturer was prepared to buy several automatic screw machines, the price of which with motor drive and necessary tools was about $6000 each. By adding to this equipment additional tooling valued at approximately $500, cost of producing the parts could have been reduced from 2 cents to 1 cent per unit. The customer's contention was that the additional equipment recommended would be too complicated for his operators to handle on the basis of one operator running three machines.

It is perfectly obvious, Mr. Brinkman asserted, that if by adding additional tools to a machine a second handling could be saved, it will reduce net production cost as compared with the gross. Often a substantial saving is effected because a part does not require an expensive second operation. Even were it necessary to reduce the number of machines cared for by one operator, the reduction in cost per finished piece would more than compensate for this expense.

This is especially true on machines producing small brass and steel parts under 1-inch in diameter from round stock, since in many instances these parts are produced anywhere from 1500 to 9000 pieces per hour. In the handling of second operations, it is difficult for the operator to produce on the average of more than 1000 pieces per hour. Not only does this require an additional operator but in many cases additional equipment in the form of machines and special holding fixtures. These are eliminated when the parts are of such a character that they can be completed in one operation on an automatic screw machine.

The latter part of Mr. Brinkman's paper was devoted to describing a recent development for eliminating the second handling of parts and dealt particularly with a principle applied some 40 years ago by the late W. S. Davenport for production of fine clock pinions. Applied to multiple spindle screw machines a few years ago, the mechanism consists of having two opposed spindles mounted in a horizontal plane. These are synchronized to run at the same speed in the same direction, each having its own independent chucking mechanism.

The opposed spindle is mounted opposite the cutting off spindle. This new spindle chucks the work before it is severed from the bar, supporting it and driving it during cut off and other subsequent operations. With this method of supporting a part while it is being cut off, it is possible to feed out the cut off tool in a good many instances twice as fast as the tool could normally be fed, and in cases where the cutting off is the longest operation, the production time may be reduced nearly 50 per cent.

### Saving in Tool Life

Tool life is increased considerably, Mr. Brinkman continued, since the number of surface feet the tool is in contact with the work, due to the heavier feed, is reduced. Normally, when a cut off tool is the least bit dull, it leaves a burr and must be reground. With the new method, the tool can be quite dull before regrinding is necessary.

The first auxiliary spindle developed was simply a holding spindle which would only drive work in the forward-most position, the speaker said. This led to development of an improved spindle which not only chucked the part in its forward position, driving it while it was being severed from the bar, but permitted withdrawing the work to any position within range of the longitudinal movement. This permitted moving a tool in a co-axial position and feeding the tool into the work on the cut-off end, or the rotating work onto the stationary tool.

The decided advantage in producing the finished piece in this manner was that the work, having been chucked preferably on a turned surface before it was severed from the bar, made it possible to do second operations such as counterboring, drilling and trepaning and to maintain unusually close concentricity tolerances. Such close tolerances were previously difficult to maintain, especially in second operations where work was stationary and tools rotated.

### Secondary Operations Costly

Discussing Mr. Brinkman's paper, W. F. Forde, International Business Machines Corp., New York, said his company agreed that special tooling should be used to eliminate second screw machine operations wherever economically sound to do so. Experience indicates that as soon as a part is cut off from the bar of stock, handling individual pieces increases manufacturing cost considerably. This is true even though the operation is simple, in fact, no more than removing a burr. Cost of secondary operations ranges from 50 to 800 per cent of the primary operations, he asserted.

Practically every type of screw machine operation can be performed on the cut off end of the part by means of special tools, or power-driven attachments. Use of these tools or attachments frequently adds no increase in time to total time to machine the piece at the end. These attachments have been used for driling, counterboring, countersinking, taper reaming, slotting, burring and shaving cuts on cut off end of a part. A shaving cut is to give an extremely fine finish and it replaces a second operation on a grinder.

Ultimate production usually determines whether it is economical to provide tooling to eliminate second operations, Mr. Forde said. Frequently it is possible to effect a saving of 50 to 80 per cent of parts cost by eliminating secondary operations and still be economically unsound to do so. This is only true, of course, where the cost of parts does not include cost of tooling.

For example, a year's supply of parts, including a second operation,

may cost $2500. If the second operation is eliminated, this cost may be reduced to $1250. Cost of tooling, however, may amount to $2000. If the part is in production only one year, it is obvious that its manufacture should continue on the basis of a second operation, as to make the part complete, when cost of tools is included, would cost $3250.

If expected manufacture of the part is two years, then obviously the special tooling should be provided at the cost mentioned. On this basis, ultimate cost of a two-year supply of parts, including tool cost, would amount to $4500, instead of $5000.

The following yearly savings were accomplished at the Endicott plant at tool costs noted:

| Yearly saving | Tool cost |
|---|---|
| $1020 | $ 600 |
| 7409 | 2200 |
| 1591 | 900 |
| 4782 | 1200 |

In addition to the savings listed, savings were realized through release of the machines used on secondary operations for other work.

Some of the special tooling required to eliminate secondary operations is flexible in its application to a variety of parts. This is particularly true if attachments required for secondary operations as drilling, facing and burring the cut off end of the part. Expense of the equipment can be justified frequently by grouping the savings on a number of parts.

Use of special tooling and attachments has been thoroughly proved on single-spindle automatic screw machines. In fact, most manufacturers find it advisable to equip a certain percentage of their machines with one of the more commonly used devices. In Mr. Forde's opinion, a similar policy will be used with respect to multiple spindle machines in the future, and already is in effect on the smaller sized units in his own plant.

### Compares Gear Types

Industrial applications of spiral bevel and hypoid gears were discussed in a paper by A. H. Candee, mechanical engineer, Gleason Works, Rochester, N. Y. The paper included a definition of terms and a general comparison of the two types of gears with other types. Features and advantages peculiar to each type were dwelt upon as were also tooth contact conditions, elements of good and bad design, importance of accurate mounting and assembling, size range and ratios, materials and lubrication.

Mr. Candee stated that as long as shafts can be kept on center, spiral bevel gears should be employed. However, when there is some good reason for offset shafts, hypoid gears are available. Hypoids are smoother in action and much stronger in the usual arrangement than spiral bevel gears, but they cost more to design.

Helical gears with crossed axes, having only point contact in contrast to the line contact of other types, are not satisfactory for transmitting power, the speaker continued. They are looked upon as makeshifts by those familiar with gear manufacture and applications. It is usually a simple matter to change to either worm drive or bevel gears. The worm drive might require making of a special hob; but the bevel gears could probably be generated by cutters already available.

Lubrication requirements with bevel gears are much the same as with spurs and helicals, Mr. Candee asserted. At ordinary speeds a splash method is adequate. At pitch-line velocities higher than 2000 feet per minute, good practice calls for some kind of forced lubrication. Hypoid gears usually require one of the extreme-pressure lubricants developed for the purpose.

### Inspection Purpose Two-Fold

Addressing an evening session on inspection methods, C. L. Bausch, vice president in charge of research and engineering, Bausch & Lomb Optical Co., Rochester, N. Y., asserted inspection is practiced for two reasons: To insure the customer receiving products suitable to his wants; and to give the manufacturer proper control of quality to maintain his reputation and a proper cost level.

The problem then, Mr. Bausch said, becomes one of sizing up customers and setting standards and limits to insure products that they can accept with confidence and satisfaction and products that can be made at a profit.

The foundry metals session on May 11 was sponsored by the American Foundrymen's association and was conducted under the chairmanship of D. M. Avey, secretary of the association, Chicago. Three papers were presented and dealt respectively with physical properties and engineering applications of steel castings, gray iron castings and malleable iron castings.

R. L. Collier, secretary, Steel Founders' Society of America, Cleveland, and H. J. Shiffli, production engineer, American Steel Foundries, Chicago, jointly presented the steel castings paper prepared by F. A. Lorenz Jr., vice president of the latter company. A. C. Denison, president, Fulton Foundry & Machine Co., Cleveland, discussed gray iron; and Enrique Touceda and J. H. Lansing, consultant and shop practice engineer, respectively, Malleable Founders' society, Cleveland, jointly dealt with malleable iron.

The steel castings paper was concerned chiefly with the factors which determine proper and economic use of castings and welded construction. Mr. Lorenz made it clear that use of castings or welding should not be regarded as competitive but as complementary. Each has its legitimate field, and each has had its misapplications. In many instances, he said, proper combination of the two results in structures which render superior service.

Speaking on behalf of gray iron, Mr. Denison maintained that engineers are not appreciating fully the advantages of the high-strength irons developed in recent years. Most of these irons contain alloying elements and precise foundry control assures castings which are sound and entirely capable of performing extreme service. In addition to high strength and other physical properties which Mr. Denison stressed were resistance to wear, corrosion and high temperatures; damping effect; low deflections under load; and response to heat treatments, including flame hardening.

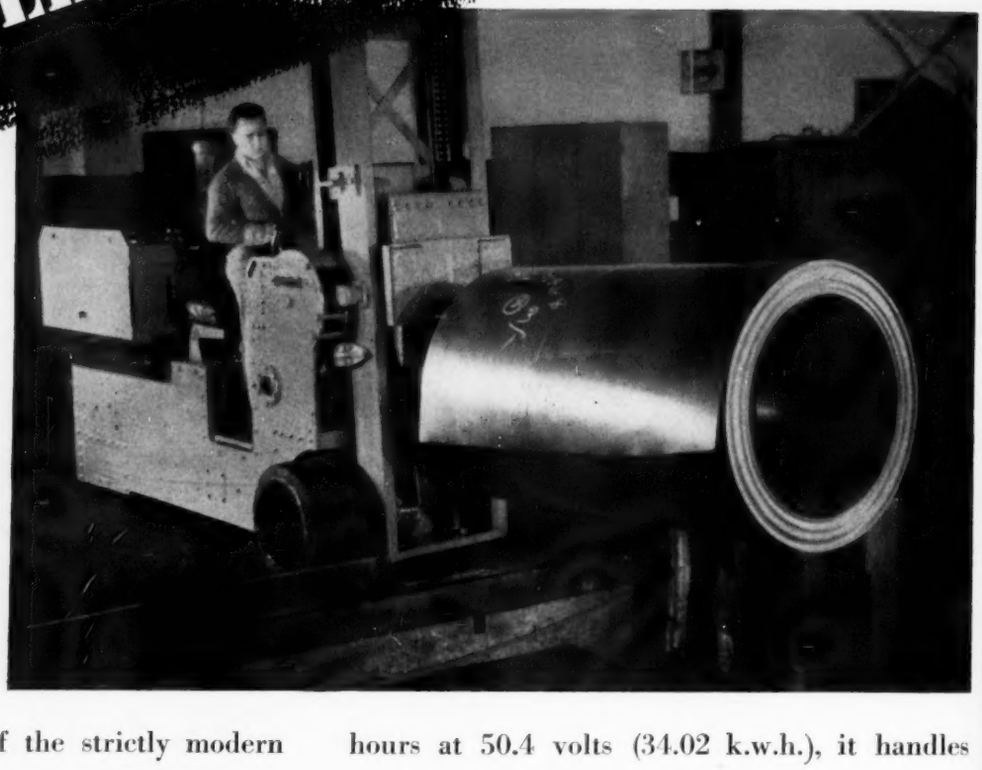
Dr. Touceda traced the development of malleable iron over many years to the present-day, high-quality product. This development has led to establishment of most acceptable specifications, and the material thereby has been made available for a widening field of applications. Properties which the speaker stressed were shock resistance, toughness, and ease of machining. Mr. Lansing's portion of the paper pointed out many of the applications in which malleable is showing excellent service.

### Apprentice Training Pays

Speaking at the banquet, G. B. Heddendorf, education department, International Business Machines Corp., Endicott, N. Y., outlined the apprentice training program carried out by his company. The program involves training high school graduates for a period of three years in classroom and shop work, the goal being to produce high-class toolmakers. Instituted because of a shortage in skilled men, the training has performed its function well and all graduates have remained with the company. A recent survey also revealed that the apprentice school is returning a profit to the company, although it was not established with that object in mind.

Final session of the meeting was devoted to methods, with W. L. Bond, general superintendent's office, General Electric Co., Schenectady, N. Y., discussing trends in shop practice and drafting, and W. D. Turnbull, manager, machinery electrification section, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., describing new shop electrical equipment.

# MODERN TRUCKS HAVE PLENTY OF POWER



CHARACTERISTIC of the strictly modern battery industrial truck is a great abundance of power and battery capacities adequate for *continuous* operation.

The truck shown above is a good example. Powered with two sets of 42 C12's, each ample for 12 hours of operation, each rated 675 ampere hours at 50.4 volts (34.02 k.w.h.), it handles rated loads of 8 tons 24 hours a day.

And it has a full 50 per cent. reserve, too; if by chance the duty should increase, this reserve may be drawn upon merely by exchanging batteries at 8-hour instead of 12-hour intervals.

With batteries so engineered, such a truck is probably the nearest approach to a dependable, trouble-free, continuous material handling unit thus far developed.

Similar principles can be applied to older trucks on which the duty has been increased since first installed. In most cases it is not necessary to wait till the present batteries wear out—provided they are alkaline batteries. Ask our representative.

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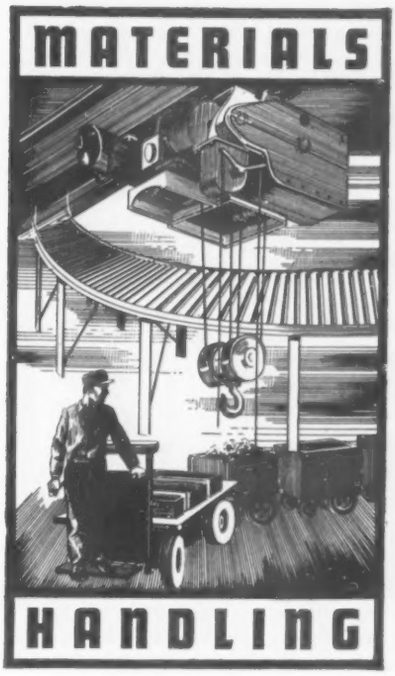
**THOMAS A. EDISON, INC. • WEST ORANGE, N. J.**




# Pickling Sheets

**A new installation combines gravity conveyors, turntable sections, fiber disk conveyors and a series of roller tables to carry sheets for pickling operations**

J. A. CRONIN, Materials Handling Editor

■ SEVERAL UNUSUAL features are incorporated in a materials handling system installed recently in a large steel mill to handle transportation of sheets in connection with batch pickling and scrubbing. It combines gravity conveyors, turntable sections, fiber disk conveyors and a series of roller tables to carry sheets to the various operations.

Sheet packs, 7 x 10 feet maximum, are deposited by electric overhead traveling crane onto a roller conveyor. Maximum weight of packs is 20,000 pounds. Moving by gravity they come to a point where the sheets are removed from the pack and stored on edge in a stake rack. This rack is supported by a short section of roller conveyor mounted on a 25-foot diameter turntable.

### Rotates Rack

After a rack is loaded, the turntable moves around 90 degrees, bringing an empty rack into position for loading. The second rack receives its allotted load of sheets and the turntable rotates another 90 degrees. The first rack has moved a similar 90 degrees, and has reached a point where chains of a vertical sheet pickler are attached and the rack lifted off the turntable section to the pickler. A rack of sheets which has just completed the cycle of pickling then is deposited on an empty section of the turntable and the latter is ready again to be rotated 90 degrees.

Sheets for the pickler are removed from the rack and placed singly on a chain driven, fiber disk conveyor having a surface speed of 100 to 300 feet per minute. Sheets are discharged onto a chain-driven live-roller table set at right angles as shown in Fig. 1. The rollers of this table are skewed, causing sheets to be centered against an adjustable guard before entering the acid tank.

After passing through the acid, the sheet moves through a water tank, a caustic spray and a scrubber to be discharged onto a dryer table. This is a chain driven, fiber disk unit. Heated air, blown against top and bottom of sheet as it passes over the dryer table, causes rapid drying. After drying is completed, sheets travel on another chain-driven disk conveyor which discharges onto a chain-driven roller table.

From this unit, the sheet passes onto chain-driven live-roller tables feeding a skin-pass mill, moving from there to a table which conveys the sheets to a roller leveler. This unit discharges the sheets onto a piler with roller conveyor set close to the floor for piling the sheets. All tables are chain driven type with a surface speed of 100

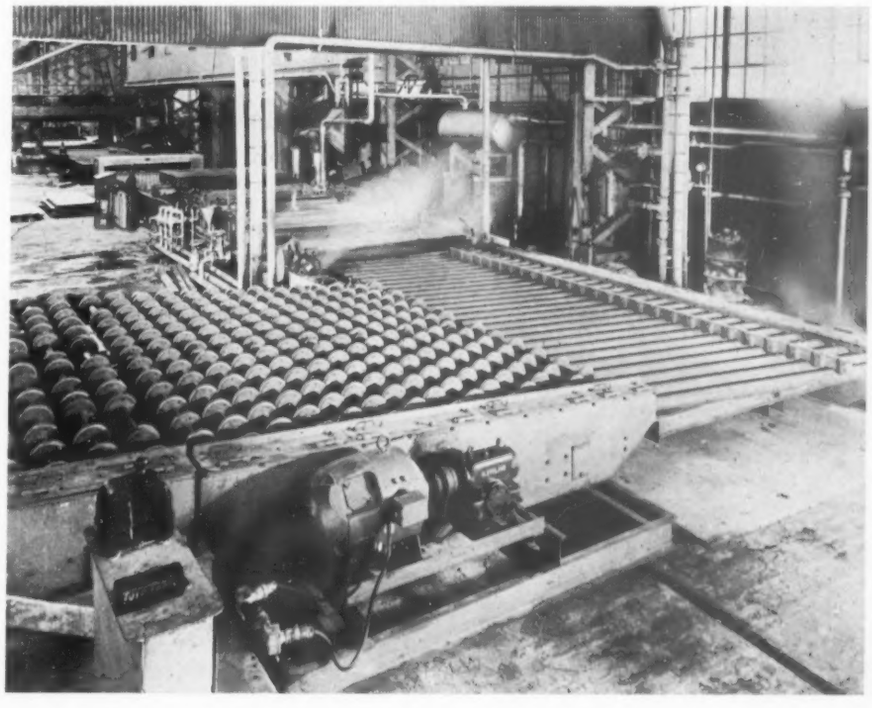


**Fig. 1—View showing fiber-disk conveyor feeding the live-roller table. Disk conveyor section with separate motor drive is portable and can be moved to one side on tracks set in floor**

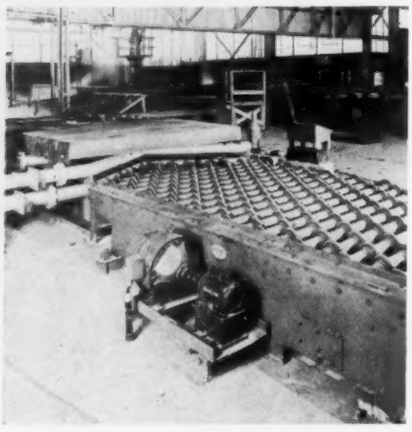


Fig. 2—This fibre disk conveyor is used to carry sheets away from the dryer. Photos courtesy Mathews Conveyer Co., Ellwood City, Pa.

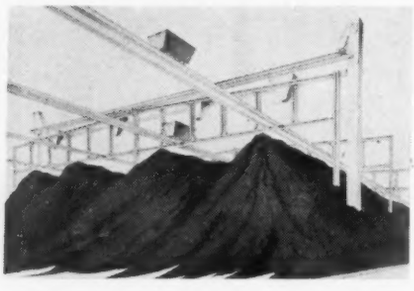
to and including 300 feet per minute.

Fig. 2 shows a portable section of the disk conveyor which with its motor may be moved to one side along 40-pound rails set in the floor. Fig. 2 illlustrates the other disk conveyor on which sheets are moved after they are discharged from the dryer.

# New Truss Allows Carrier Passage

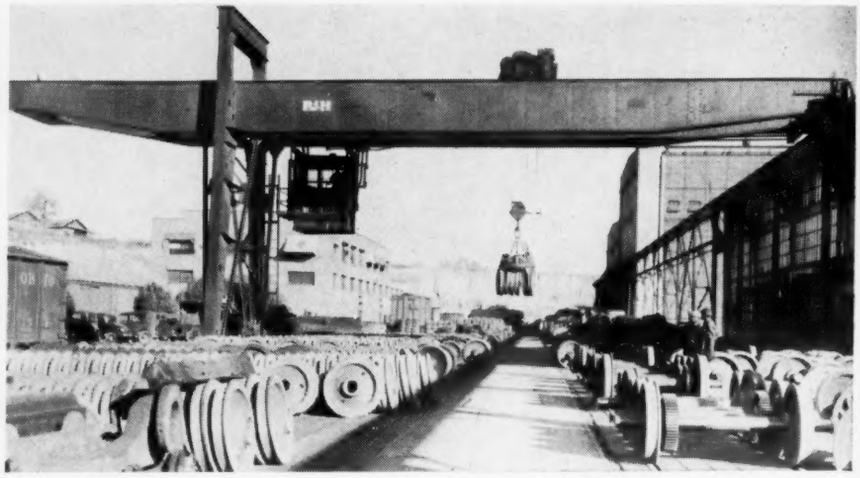
■ IN A NEW PLANT now being erected for International Agricultural Corp. in Chicago Heights, Ill., is employed a unique design of all-welded portal truss, as shown in the accompanying illustrations. By utilizing an open web system of fabricating, space above the bottom chord can be utilized advantageously. Also, other economies are obtainable since chain conveyors can

(*Concluded on Page* 84)



Portal truss construction at International Agriculture Corp. enables space above bottom chord to be utilized for conveying equipment. Carriers may run on rails at bottom of openings as shown or may be suspended at top of truss openings

## Wheels Are Handled With Magnets



■ Outdoor single-leg gantry crane handles wheels with an electric magnet at the Jackson, Tenn., shops of the Mobile & Ohio railroad. Photo courtesy Harnischfeger Corp., Milwaukee

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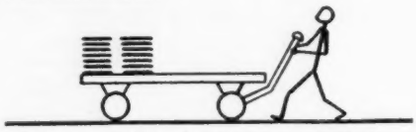
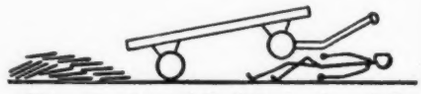
### Stickman Picture of an Accident Which Occurred to Ben Blank, a Tin Mill Opener

**The Situation:**



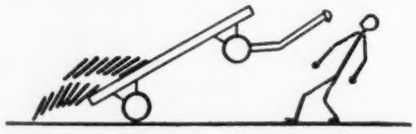
Shearman John Doe had incorrectly loaded the first two stacks of sheared sheets on rear end of the hand truck. Ben Blank was called over to push the truck back so that the front end could be loaded by the Shearman. Ben gave one big push and the truck did not move.

**The Accident:**



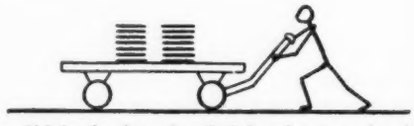
When the sheets fell off the back end, the front end fell down to floor again, knocking Ben down and coming to rest on his right ankle, causing a fracture and a lot of pain, misery and loss of wages.

**The Action:**



This made Ben sort of angry so he gave another push and a heave at the same time. With the truck so heavily loaded in back this lifting caused the front end of the truck to rise up in the air which in turn caused the sheets on rear end to slide off.

**The Remedy:**

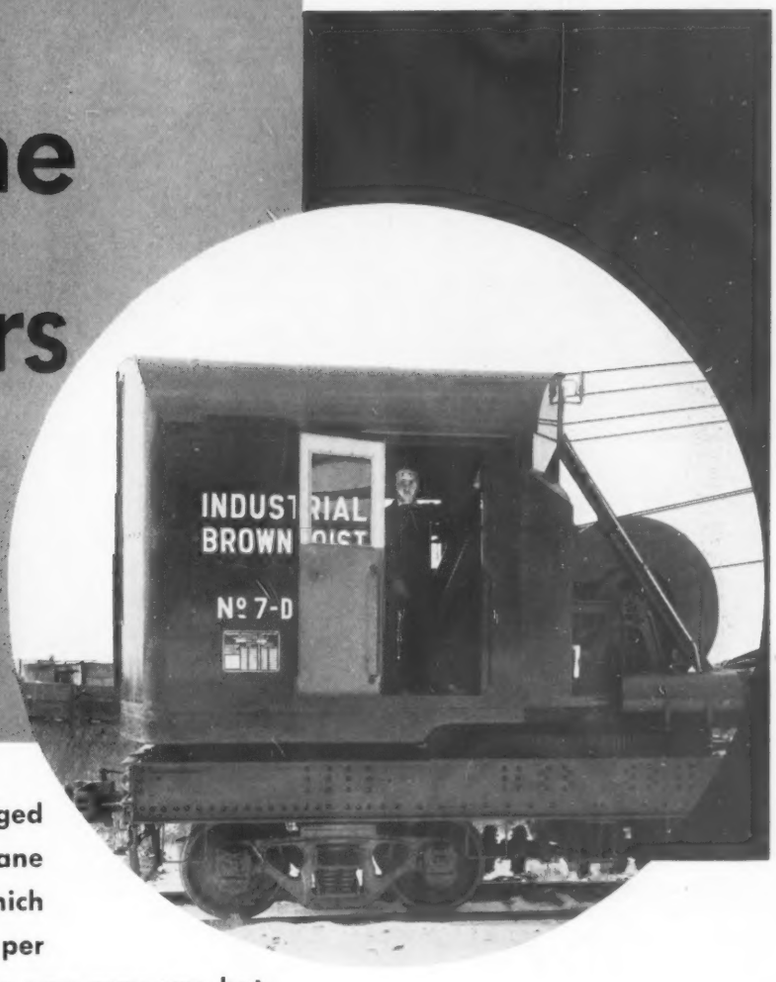


If John had not loaded the sheets on back end, the accident could not have happened. If Ben had not lost his temper and had not heaved so much on the handle but had asked the Shearman to help him, the accident would not have happened.

**Correct Early Loading of Hand Truck**
**Help Us to Help You**
**We Don't Want Any One to Get Hurt**
**Stop and THINK!**

■ AN EFFECTIVE method of accident prevention, devised by Earl Spitzer, a safety engineer in the Pittsburg, Calif., plant of Columbia Steel Co., is described and illustrated in the April issue of *US Steel News*. The system is called by its originator the "Stickman Axigraph" because of the stick-type bodies which are used to represent men in the pictures. In a series of pictorial stories, accidents of various types, which may occur when a workman performs his job the wrong way, are portrayed. The "axigraph" above is typical of the many graphic stories that have proved effective in creating among company employes a consciousness of the importance of safe practices in materials handling and in other phases of their everyday work.

# for Crane Operators Only




Like all operators, you are judged by the amount of work your crane turns out; by the condition in which you keep it and by the cost per ton of materials handled. True, you may say, but why write an ad about it?

You will get the best answer to this question from the man who is "running" a new Industrial Brownhoist—particularly one of the Diesel or gas models. Ask him how many tons he can handle a day; about switching speeds and fuel and maintenance costs. Finally, if he will let you, operate his crane a while and get the feel of it. Then you will know how he can turn out so much more work so easily and at such low cost.

If you don't know where a new Industrial Brownhoist is working, we will be glad to tell you. And here's a tip—take the boss along when you go to see it. He will be just as interested as you are.

GAS AND DIESEL CRANES
10 to 75 tons capacity

STEAM LOCOMOTIVE CRANES
10 to 200 tons capacity

CRAWLER CRANES

CLAMSHELL BUCKETS

COAL AND ORE BRIDGE CRANES

PILE DRIVERS

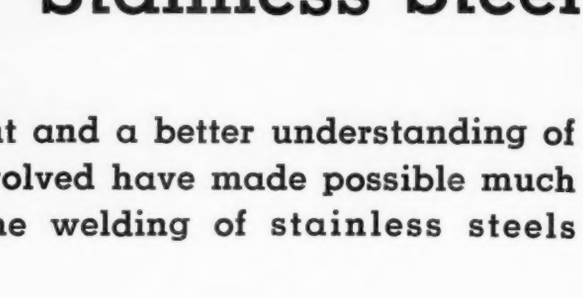
**INDUSTRIAL BROWNHOIST**

GENERAL OFFICES: BAY CITY, MICHIGAN
DISTRICT OFFICES
New York, Philadelphia, Pittsburgh, Cleveland, Chicago,
Agents in Other Principal Cities

# Welding Stainless Steel

**New equipment and a better understanding of the factors involved have made possible much progress in the welding of stainless steels**

By T. R. LICHTENWALTER
Welding Engineer,
Republic Steel Corp.,
Cleveland



Freezing shelf for mechanical refrigerator fabricated by combination spot and seamless welding two sheets of Enduro stainless steel

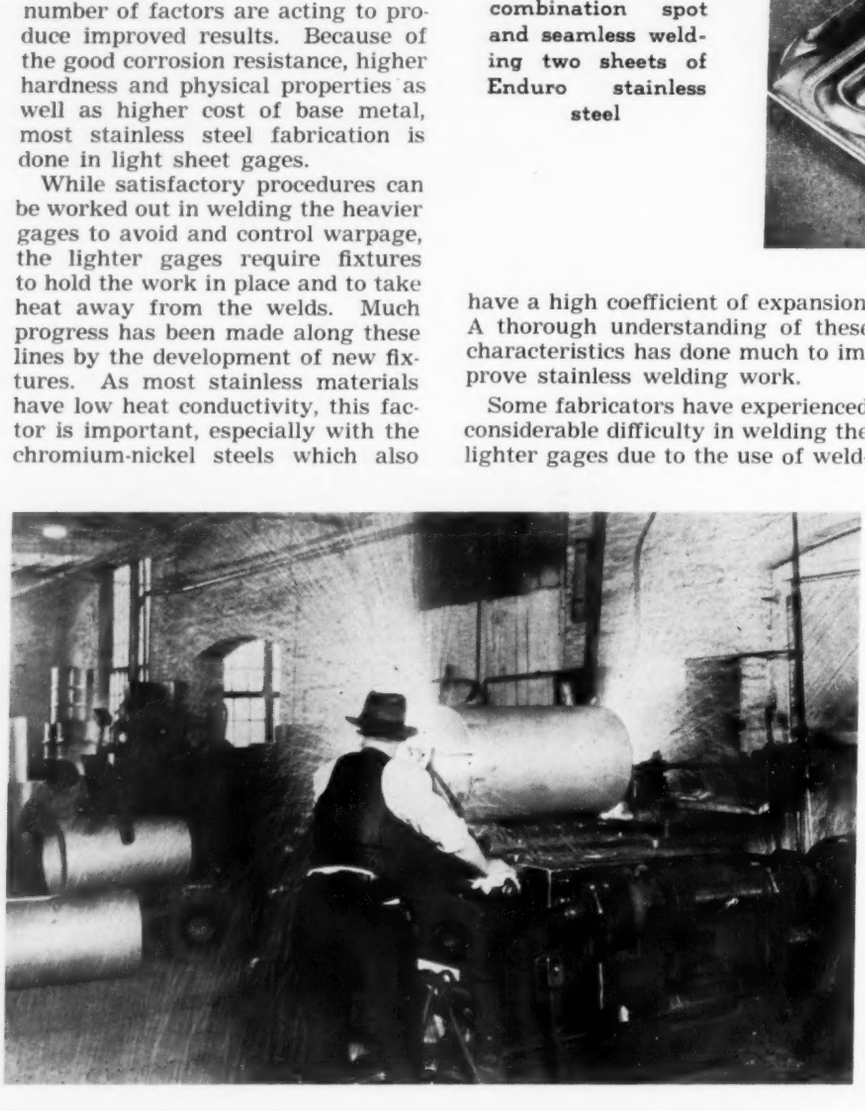
■ AS THE USE of welding in fabrication of stainless steel continues, a number of factors are acting to produce improved results. Because of the good corrosion resistance, higher hardness and physical properties as well as higher cost of base metal, most stainless steel fabrication is done in light sheet gages.

While satisfactory procedures can be worked out in welding the heavier gages to avoid and control warpage, the lighter gages require fixtures to hold the work in place and to take heat away from the welds. Much progress has been made along these lines by the development of new fixtures. As most stainless materials have low heat conductivity, this factor is important, especially with the chromium-nickel steels which also have a high coefficient of expansion. A thorough understanding of these characteristics has done much to improve stainless welding work.

Some fabricators have experienced considerable difficulty in welding the lighter gages due to the use of welding machines not fitted especially for this application. Now there are small motor generator sets available that are ideal for this type of work. As stainless steel requires much less heat to weld, several fabricators have reported excellent results with these machines.

Development of tube regulators for use in resistance welding makes possible improved heat control and thereby assures more uniform and accurate welding results. Stainless steel resistance welds are subject to intergranular corrosion throughout certain ranges and the newer control equipment assures elimination of this trouble when proper welding cycles are worked out.

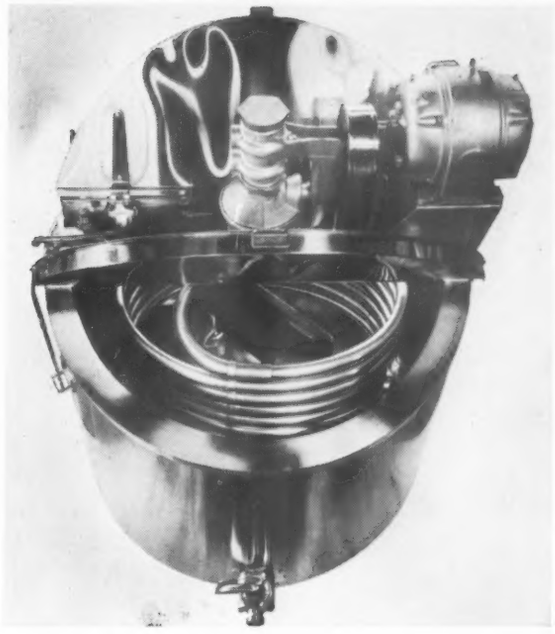
Oxyacetylene welding equipment also has been improved so that flame adjustments can be maintained accurately over long periods of time, due principally to better pressure



Here 55-gallon Coca Cola shipping containers are being fabricated from Enduro 18-8 stainless steel with low carbon content. This flash welding is at plant of Stevens Metal Products Co., Niles, O.

regulators recently developed. The past year also has seen considerable extension of the atomic hydrogen process in connection with stainless steel welding.

This last year, more stainless fabricators have turned to welding and present interest indicates the future will see still more welded articles. In this connection, anyone contemplating the use of stainless steel welding for the first time will do well to draw upon the huge fund of experience which has been formed by those who have passed through its development stage.



Arc welded 250-gallon milk pasteurizer, stainless steel inside and out. Welds are ground down and polished to match finish of sheets

### Determine Type

The first thing to consider when welding stainless steel is to determine which type it is—whether it belongs to the straight chromium or the nickel chromium group. The straight chromiums are magnetic and give brittle welds in the as-welded condition. Peening while hot appreciably raises the ductility except in the air-hardening types (under 14 per cent chromium). Peening followed by an anneal will produce fair ductility in all straight chromium welds.

Straight chromium stainless steels are available in a number of grades with chromium contents ranging from 11 to 28 per cent or higher, with or without additions of other elements such as molybdenum, nickel copper, and others, each of which produces certain physical or corrosion-resistant characteristics.

Whether or not to anneal straight chromium fabrications is a subject requiring consideration of many factors including design, operation, corrosion resistance, etc. Fabricated vessels to be used at elevated temperatures do not generally require annealing. However, corrosive liquid containers and pressure vessels should usually be annealed and the annealing scale removed.

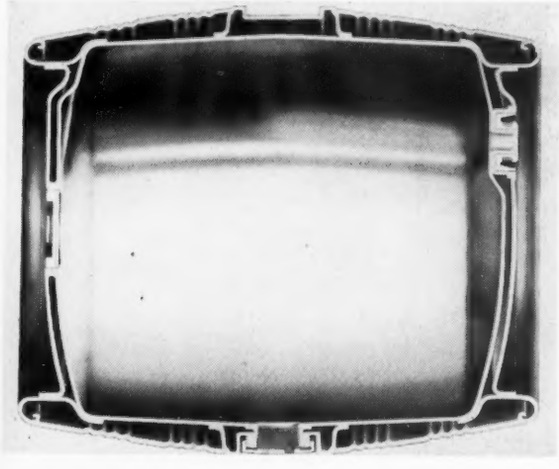
One of the most important things in designing a straight chromium job is to place welds where they will not be stressed. Best welding procedure is to use strong tack welds of the 18-8 type metal (18 per cent chromium, 8 per cent nickel) and to complete the weld with the same type of filler metal as used for the plates. Using the 18-8 metal for the entire weld, as some fabricators do, is not recommended as if the article operates at elevated temperatures, it may have to work within the critical range of the 18-8 metal. It is better not to take this chance.

On the other hand, the chromium-nickel grades of stainless steel are very ductile in the as-welded condition so that annealing is seldom of any advantage here. Welding of these grades is always done using metal of same analysis as the plates for both tacking and welding. These types range from 17 per cent chromium and 7 per cent nickel up to 25 and 20 per cent, respectively, and sometimes higher.

Usually elements such as molybdenum, columbium, titanium, silicon and others are added to provide certain corrosion or heat-resisting qualities. Each combination of alloys has been worked out to meet a certain set of conditions and for this reason filler metal of the same composition should be used to be sure that the completed structure retains the desired characteristics.

Carbon content of all stainless steel for welding should be held down and care should be taken to prevent carbon pickup in the weld metal. The loss of chromium and other volatile alloys also should be controlled. In arc welding, this can be done by using coated electrodes. In oxyacetylene welding, the proper adjustment of the flame and use of a good welding flux especially prepared for stainless work will do the trick. Resistance and atomic hydrogen welds require no flux.

While these do not include all the factors to be considered, they will serve as a guide on much work with stainless steels and may point the way to improved results in many cases.



Inner lining of beer barrel shown at left is stainless steel, welded by atomic hydrogen method at plant of Firestone Steel Products Co., Akron, O.

Manifold for airplane exhaust on the right is made of Enduro stainless steel sheets formed and welded

# CARBORUNDUM SERVES TH
# WITH THESE OUTSTANDING RE

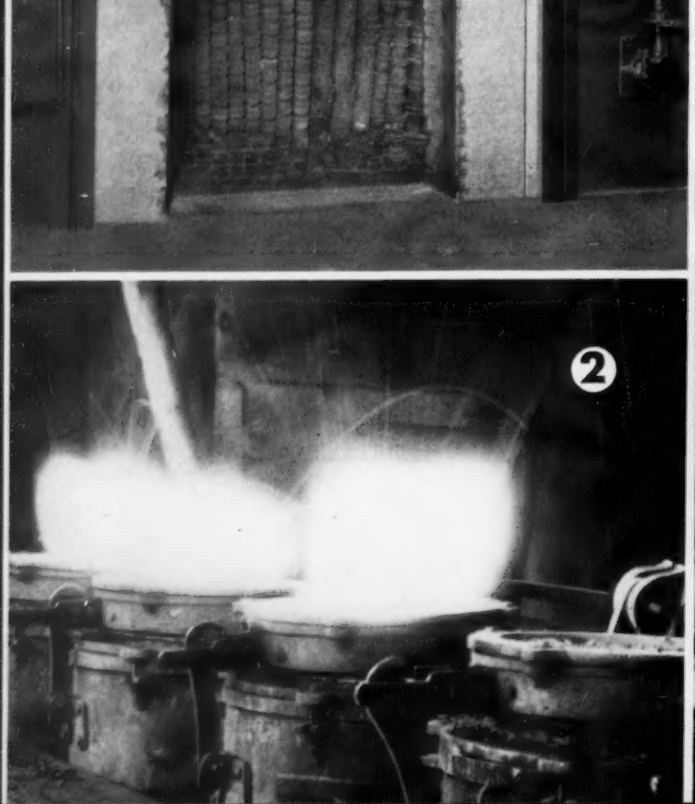
"CARBOFRAX" (*silicon carbide*) REFRACTORIES

"ALFRAX" (*fused alumina*) REFRACTORIES

"MULLFRAX" (*mullite*) REFRACTORIES

THE CARBORUNDUM COMPANY RECUPERATOR

"FERRO CARBO" CUPOLA ADDITION



# E THE FOUNDRY INDUSTRY
# N REFRACTORY PRODUCTS

**IN THE MALLEABLE FOUNDRY** The Carborundum Company Recuperator saves fuel in the air furnace by furnishing preheated air for combustion. See illustration No. 3 . . . Carborundum Brand Firesand is used for patching at the metal line of air furnaces . . . "Carbofrax" muffles and "Carboradiant" chambers for Malleable Annealing Furnaces. See illustration No. 1.

**IN THE STEEL FOUNDRY** "Carbofrax" brick are used for lining dry ports in acid open hearths giving increased port life.

**IN THE GRAY IRON FOUNDRY** "Ferro Carbo" is used as a cupola addition for a deoxidizing agent resulting in an oxide free iron, with high strength and hardness but still readily machineable . . . "Carbofrax" slag hole blocks eliminate possibility of slag hole failures on continuous pouring operation.

**IN THE ALUMINUM FOUNDRY** "Carbofrax" brick for melting furnace linings give a metal free from lining inclusions . . . "Carbofrax" tile provide a means for indirect heating to prevent metal oxidation . . . "Carbofrax" brick in fire boxes of coal fired furnaces eliminate clinker adhesion and reduce firebox repairs . . . "Carbofrax" pyrometer protection tubes eliminate possibility of iron contamination.

**IN THE NON-FERROUS FOUNDRY**

***Crucible Furnaces*** "Carbofrax" shapes for ring linings, crucible rests and lids . . . "Carbofrax" No. 3 and No. 5 cements for ramming and monolithic linings. Illustration No. 2 . . . "Carbofrax" No. 10 cement for patching linings.

***Ajax-Wyatt Furnaces*** "Alfrax" and "Mullfrax" prefired loops give long, trouble-free service.

***Detroit Electric Furnaces*** "Alfrax" and "Mullfrax" shapes for preformed linings . . . "Alfrax" and "Mullfrax" cements for rammed linings.

***Open Flame Furnaces*** "Carbofrax" brick and shapes for preformed linings . . . "Carbofrax" No. 3 and No. 5 cements for rammed linings. Illustration No. 4.

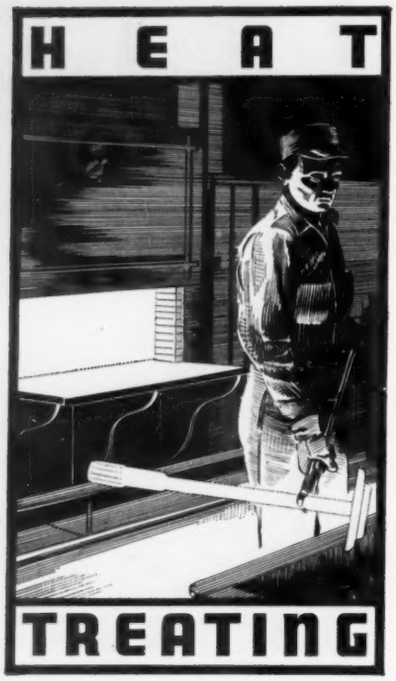
***Non-Ferrous Cupolas*** "Carbofrax" brick and shapes for linings and tuyere blocks.

***Ladles*** "Carbofrax" No. 3 and "Firefrax" No. 2 cements for ladle linings.

REFRACTORY CARBORUNDUM PRODUCTS

THE CARBORUNDUM COMPANY, REFRACTORY DIVISION, PERTH AMBOY, N. J.

(Carborundum, Carbofrax, Alfrax, Mullfrax, Firefrax and Ferro Carbo are registered trade-marks of The Carborundum Company)




# Welded Boiler Tubes

**Strip steel, formed and butt welded into continuous tubes, is normalized, completely recrystallizing steel so joint cannot even be detected by micrographs through section**

■ BOILER operating pressures and temperatures have increased steadily during the past 50 years, placing more demands upon material and equipment. Tubes, being the very heart of the boiler, have been highly developed to insure uniformity and safety.

Heat treating is a major operation at Cleveland plant of Steel and Tubes Inc., subsidiary of Republic Steel Corp., where a new continuous controlled-atmosphere furnace for normalizing and bluing boiler tubes has been installed recently. About a year ago the company erected a new building to house the boiler tube department and installed a large controlled-atmosphere annealing furnace. Steadily increasing demands have necessitated an addition to this building, practically doubling its capacity, and also the installation of a second furnace with much additional equipment.

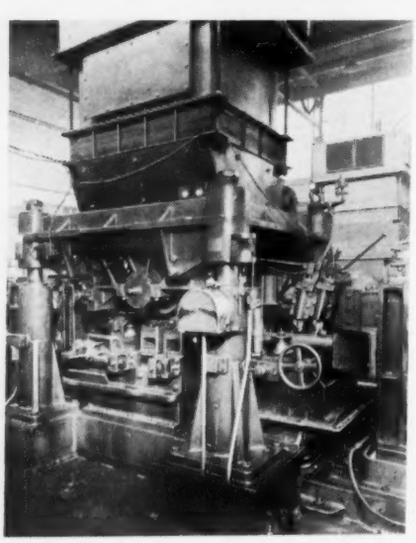


**Fig. 1—Continuous seam welder. Steel strip is formed and butt welded by electric resistance method using rotating disc-type electrodes. Finished tube can be seen emerging just to right of welder where outside burr is being cut off**

### Flat Stock Shaped

This company makes Electrunite resistance-welded boiler tubes by the patented Johnston welding process. Flat rolled steel of accurate width is passed through a series of rolls of varying contour which shape the flat stock into a butted tube which is passed directly under a pair of copper disks acting as electrodes, one disk making contact with the surface of the tube on each side of the seam. Lower half of tube under these electrodes is supported by a pair of steel rolls which exert pressure on tube sides at instant of welding to force seam edges together. Chemically, the steel is not altered by welding as heat generated is due to resistance to flow of current at the joint. No extra metal is added.

Process employed in making Electrunite boiler and pressure tubes is continuous, which includes forming, welding and sizing immediately after welding. Amount of metal extruded both inside and outside the tube is small because pressure, temperature, contact and speed have been so correlated that they heat the edges of the steel only. Heat does not penetrate into the body of the metal.

The slight upset or burr formed at the weld is removed by cutting tools both inside and outside the tube. Fig. 1 clearly shows tool for removing outside burrs.

Tube as it comes from the welder will stand up under all routine tests in the factory as well as tests used in boiler tube specifications. Periodic samples are roller expanded and flanged. Test specimens are taken while tube is being welded and tests made immediately. Fig. 2 shows crushed, expanded and flared, and flattened test specimens. This tube is uniform in wall thickness within about 0.003-inch in any cross section.

As microstructure at the weld is slightly changed and tube is a little harder at this point, it is normalized at a temperature above the upper critical point of the metal. Normalizing completely recrystallizes the steel, relieving all welding and cold working stresses, and produces a homogeneous fine-grain microstructure of uniform hardness.

Formerly, normalizing at 1650 degrees Fahr. formed a light loose scale. Tube then was pickled, producing a uniform scale-free surface but one that was dull in appearance and readily subject to corrosion due to its porosity. To preserve the original dense, cold-worked corrosion inhibiting surface, annealing now is done in a reducing atmosphere.

The new furnace is suitable for both annealing and normalizing as

**Fig. 2—Crushed, expanded and flared, and flattened boiler tube test samples**

# B & W INSULATING FIREBRICK

# 160 Tons STRESS-RELIEVING CAPACITY

*write* FOR BULLETIN R-2-E

Stress-relieving furnace built in 1937 for the Chicago Bridge & Iron Company, Birmingham, Alabama, by the Rust Furnace Company.

B & W Insulating Firebrick used for car flooring, sides, arch and door lining. Maximum charge: 160 tons. One of the largest of its kind ever built; 80 ft. long, 14 ft. wide, 17 ft. high.

THE BABCOCK & WILCOX COMPANY
Refractories Division
19 Rector Street New York, N. Y.

R-6

# BABCOCK & WILCOX

it has a temperature range of 1200 to 1800 degrees Fahr. It is heated by horizontal, gas-fired, alloy-steel radiant-tube elements located both above and below the roller hearth conveyor. Boiler tubes in the furnace are surrounded at all times by a specially prepared atmosphere which prevents oxidation so tubes leave with their original bright cold-worked luster. Heating zone is 4 x 30 feet inside.

Fig. 3 shows the furnace proper at discharge end of the heating chamber and integral with it is a cooling zone. Shown in Fig. 5 this zone is water cooled on all four sides and is filled with reducing atmosphere. Its purpose is to reduce tube temperature below the point where oxidation occurs upon leaving the furnace.

### Atmosphere Prepared

Tubes in heating and cooling zones are surrounded by a specially prepared atmosphere made in a separate unit by cracking natural fuel gas. The atmosphere gas is refined by scrubbing, filtering, removing sulphur and dehydrating. It is fed in at a rate which keeps furnace and cooling chamber slightly above atmospheric pressure so that all leakage is outward. This leakage is burned at entrance and exit doors, hoods with exhaust fans removing any traces of incompletely burned gas.

Tubes after leaving the normalizing furnace continue on the roller conveyor across a space where they may be inspected or removed if a bright surface is desired. Boiler and pressure tubes, however, are not removed at this point but are allowed to continue on the conveyor to a bluing furnace which gives the tubes a thin blue oxide coating similar to the bluing on a gun barrel. Its purpose is to provide some measure of protection against rust in storage and shipment and to give a distinctive color. Tubes continue on the roller conveyor through bluing oven and into processing building which has been increased in length to approximately double its former capacity.

**Fig. 3 (left)—Main heating chamber of gas heated, controlled atmosphere normalizing furnace. Fig. 5 (right)—To right of stair is cooling section of large normalizing furnace with conveyor table at left where tubes are inspected and removed or allowed to go into blueing furnace just to left of equipment shown here**

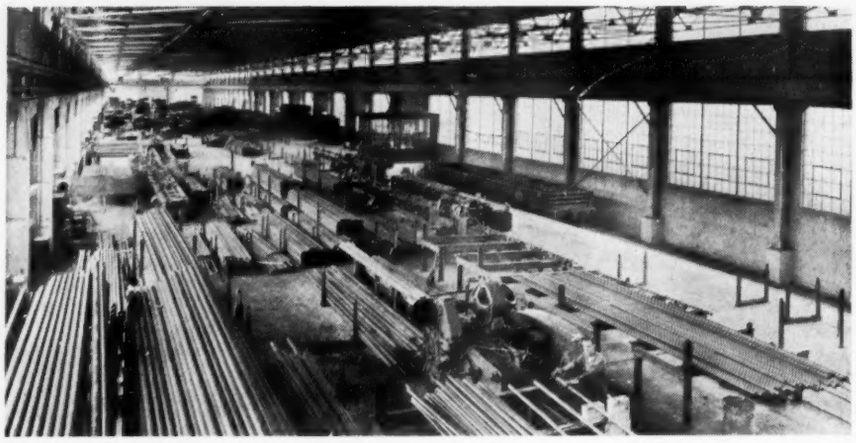


**Fig. 4—Finishing, inspection, storage and shipping departments of enlarged boiler tube building at Cleveland plant of Steel & Tubes Inc., subsidiary of Republic Steel Corp.**

### Straightline Production

Equipment in this building, shown in Fig. 4, is arranged for straightline production. Tubing is handled in lots by overhead traveling cranes which lift it out of racks at end of annealing-furnace runout table and carry it directly across the building to the straightening rolls. After leaving the straightening rolls tubes go to lathe cutoffs where they automatically pass through and drop into another set of racks opposite the hydrostatic testers. Subsequently, tubes go to other tables for visual inspection and then directly to cars on sidings within the building or are carried further back into the building for storage.

## New Hardening Process For High Speed Steel

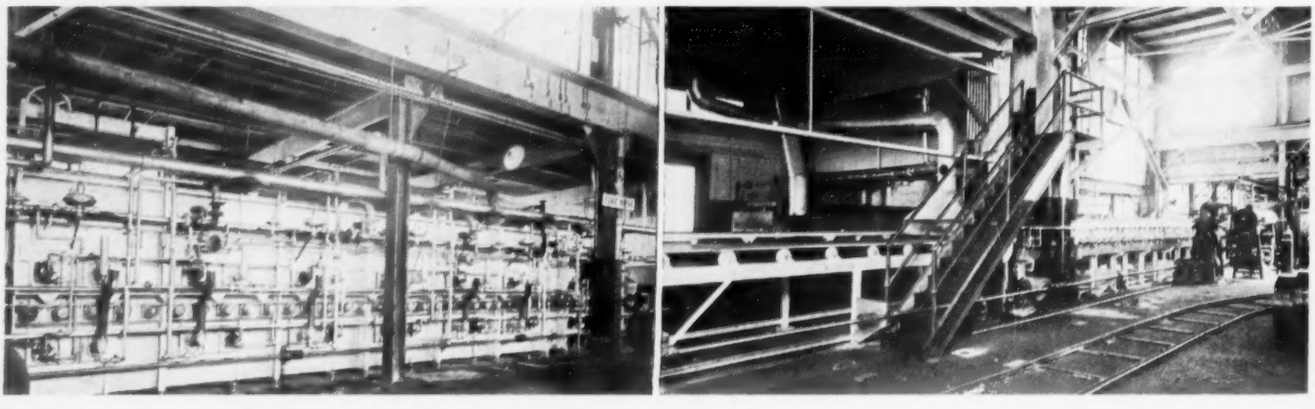
■ Bellis Heat Treating Co., Branford, Conn., has developed a new high speed steel hardening process said to produce a tough, hard product that lasts longer in service. It employs a new Triple A Lavite which from an oil, air or salt quench gives a high metallic luster. The film washes off easily. In this process the steel may be left in the bath twice as long as necessary without deleterious effects on the steel. Triple A Lavite may be used in a single unit furnace. Also, considerable decrease in furnace heat loss and in cost for holding the high temperature is claimed.

♦

## Reclaimer Cuts Costs

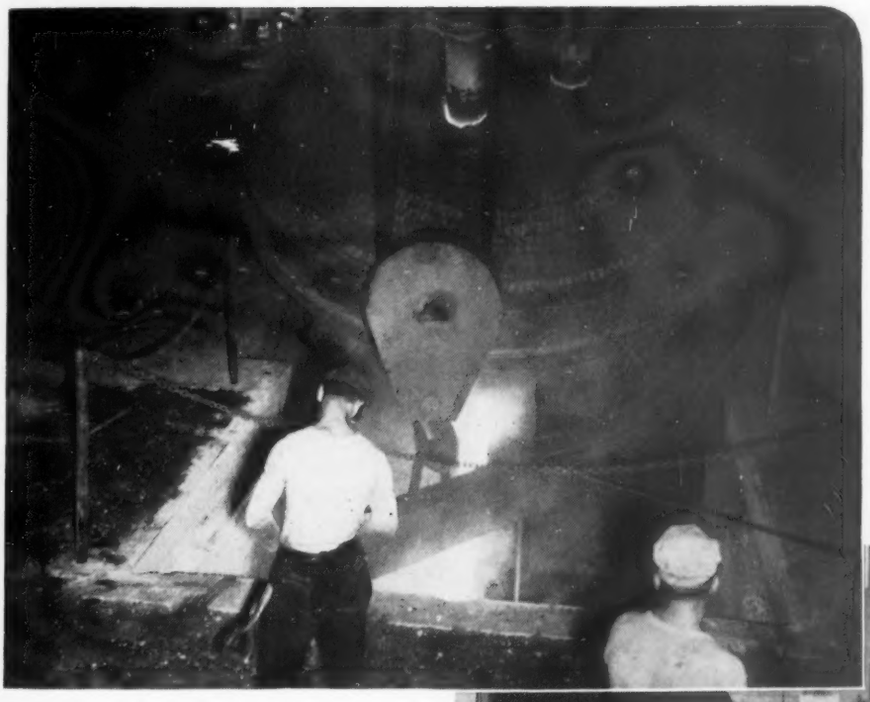
■ Oil recovery up to 90 per cent of average crank-case oil is claimed with an overall cost of about 9 cents per gallon, is said to be affected by the new oil reclaimer recently developed by Bucyrus-Erie Co., South Milwaukee, Wis.

The unit departs from the complicated distilling processes generally used with this type of equipment.



# STAINLESS STEEL

**High spots in the story of the production of stainless steel ingots, bars and wire, as exemplified in the new plant of Rustless Iron & Steel Corp., Baltimore, are pictured here**



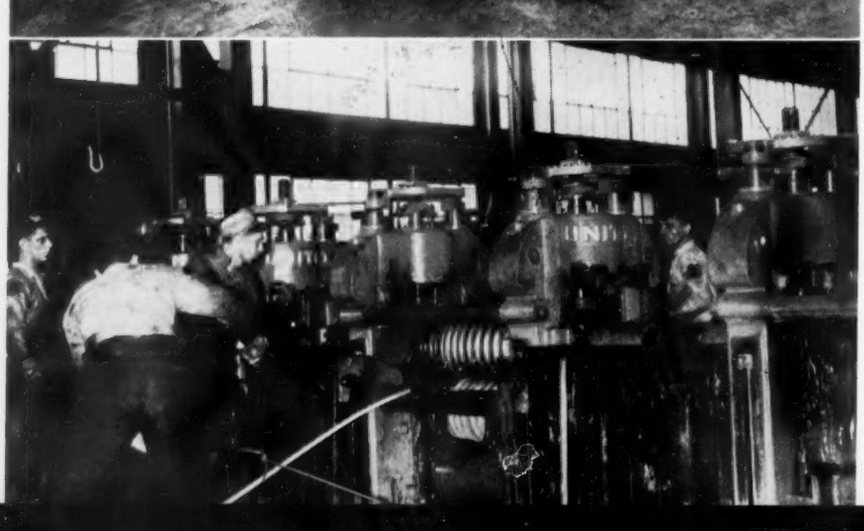
■ Rustless stainless steel is produced in Heroult electric arc furnaces with capacity of 12 tons each, with base scrap, remelt stainless steel scrap, chrome ore, ferrosilicon and lime as raw materials. This view shows the tapping operation in its later stages

■ In the production of stainless steel close chemical and metallurgical control is of utmost importance. Every heat is analyzed for all essential elements. This view shows a portion of the chemical laboratory. Equipment in foreground is used for carbon determinations

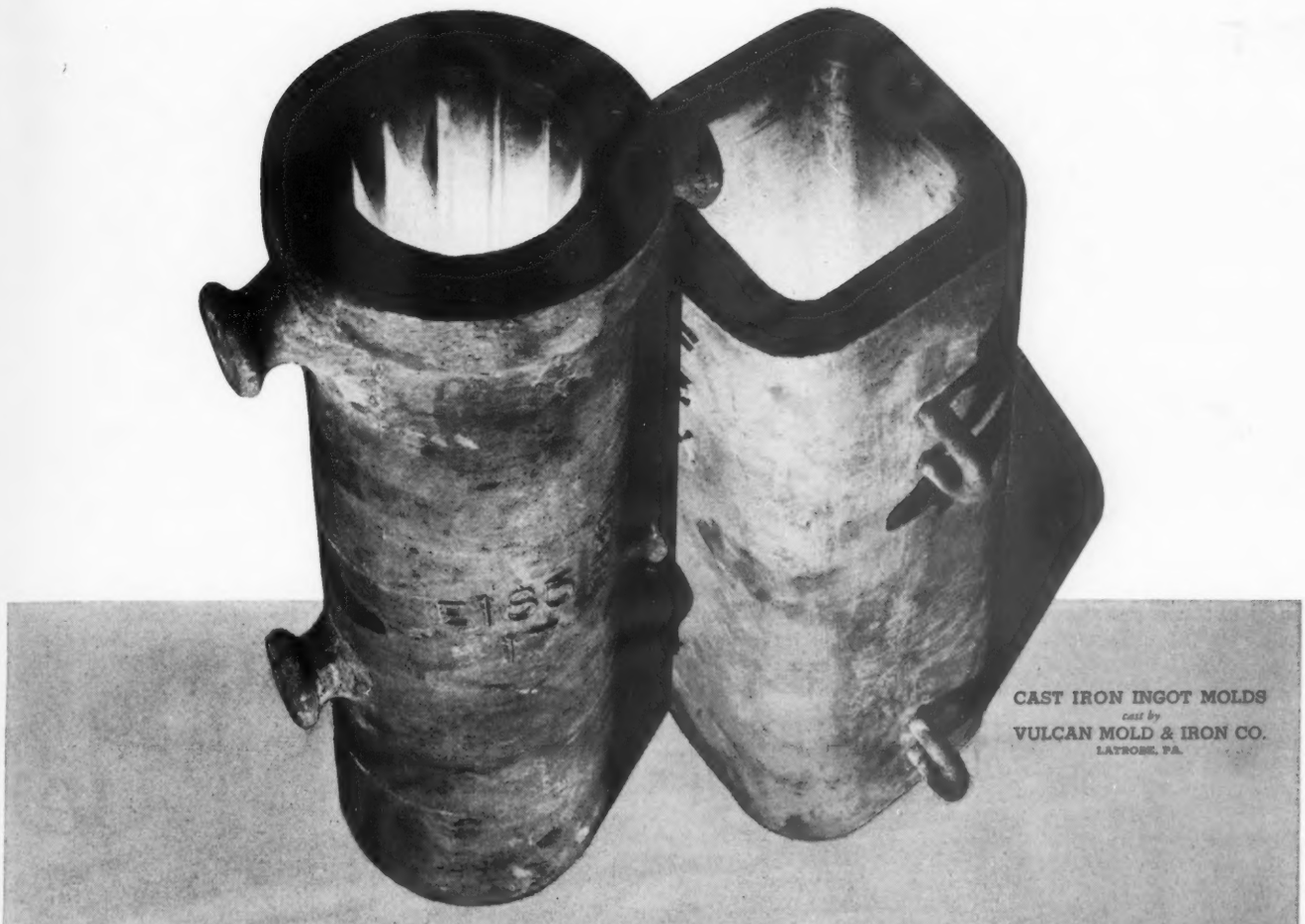
■ Molten metal from the electric furnaces is teemed into cast iron ingot molds; to prevent splashing of mold walls the metal is first poured into a graphite pot with relatively small spout opening. All ingot molds have refractory hot tops. The teeming operation requires skill and judgment to produce sound and homogenous metal. After the metal has solidified, ingots are stripped from the molds, taken to the rolling mill department, heated in oil fired furnaces and rolled into blooms and billets

■ After billets have cooled they are sent to the grinding department for removal of all scale and surface imperfections. Surface conditioning is accomplished by grinding all over, using swing-frame grinders and special bonded abrasive wheels operating at about 1500 revolutions per minute. While such conditioning is expensive it is essential to insure high quality of finished product. The grinding building is equipped with dust collection system and is adequately lighted to reveal minute defects

■ Where stainless bars are to be machined on automatic screw machines, or used for shafting, they must be true to size and absolutely straight. The draw bench shown has capacity of 50,000 pounds and was designed especially for drawing stainless steel bars. Prior to drawing bars are annealed, pickled, pointed and lime coated. After drawing bars are straightened in a Medart machine. Diameters may be reduced as much as 1/16-inch per pass which not only serves to size the bar but, in some stainless grades, increases tensile strength and hardness



■ After billets have been surface conditioned they are heated to rolling temperature in furnaces equipped with pyrometer controls. After rolling, the bars are allowed to cool and then cold sheared to lengths ranging from 14 to 18 feet. This view shows the pass next to the finishing pass on ¾-inch diameter guide rounds



CAST IRON INGOT MOLDS
*cast by*
VULCAN MOLD & IRON CO.
LATROBE, PA.

# The *New Way* to Better Castings

Nowhere can surface imperfections and irregularities in castings cause as much trouble and expense as in cast ingot molds. Every imperfection, line or wave occurring in the casting is reproduced in the ingot itself and must be removed by expensive chipping and grinding which delays the rolling operation.

Therefore, it's welcome news that, with the aid of the Randupson Process of cement molding, cast iron ingot molds can now be had free from surface imperfections and irregularities. The saving to the rolling mill in labor and time is great and the metal can be rolled down without loss. Vulcan Mold & Iron Co., Randupson licensees, are supplying these new type cast ingot molds.

The *Randupson* Process, introduced in America by Birdsboro, provides a new way to obtain cleaner surface, true-to-pattern castings for *any* industrial use. Specify *Randupson Process* for better results on your next casting job.

**Sole licensing agents for Randupson Process in U. S. and Canada**

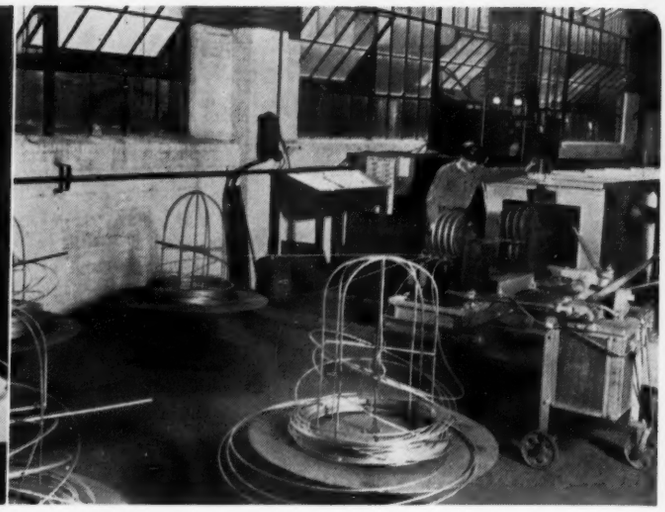
# BIRDSBORO

## STEEL FOUNDRY AND MACHINE COMPANY

PLANTS AT BIRDSBORO AND READING, PENNSYLVANIA

STEEL CASTINGS • STEEL MILL EQUIPMENT • HYDRAULIC MACHINERY • SPECIAL MACHINERY • CRUSHING MACHINERY • STEEL AND CHILL ROLLS

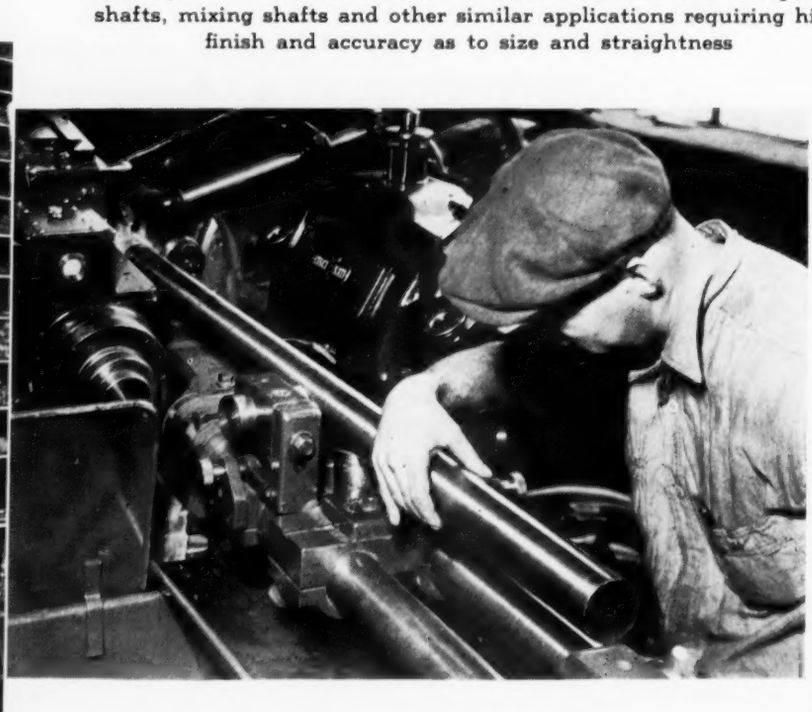
■ Stainless steel wire is drawn on the conventional draw block but, due to its greater strength and toughness, drafts on each pass are somewhat less than for carbon steel wire. Carboloy dies are used and reductions range from 20 to 40 per cent depending on the alloy drawn. For heavy reductions wire is copper coated and flake soap used as die lubricant. The cold drawing operation serves not only to size the wire but imparts a smooth finish of high lustre. This operation also increases the strength of some alloys and moderate reductions improve the machineability of all



■ Intermediate annealing of cold drawn stainless steel wire is done in this continuous 4-strand furnace. Stainless steel possesses a fairly high electrical resistance and this property is utilized to preheat the wire before entering the furnace; preheating is accomplished rapidly and the wire enters the furnace at near the annealing temperature. This permits the furnace chamber to be shortened and greatly increases its capacity. After annealing the wire is pickled for further processing

■ Rustless stainless steel bars are available in rounds, hexagons, flats, squares and special sections in a variety of surface finishes. Stock rack is of an enclosed type to facilitate handling and to protect bars from dust which in handling might scratch or mar the highly finished surfaces

■ Where stainless bars must have a ground finish they are passed through a centerless grinding machine which reduces diameter several thousandths of an inch and imparts a high finish. Finishing department is equipped with modern machines capable of handling bars up to 4 inches in diameter. Ground bars are used for pump shafts, mixing shafts and other similar applications requiring high finish and accuracy as to size and straightness



# THE INSIDE STORY

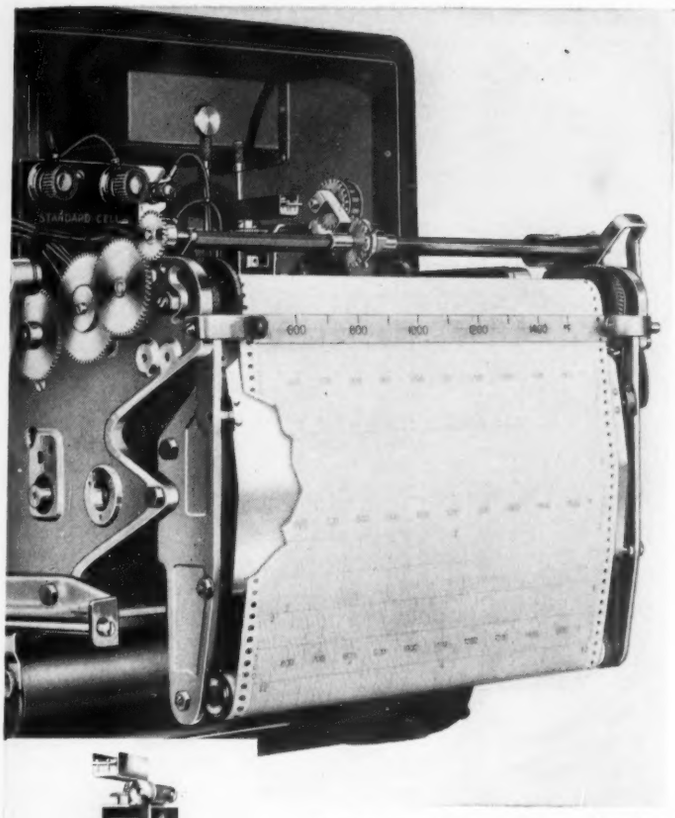
## of a perfect record

Foxboro Pyrometer Recorders are known for their silent action . . . their accuracy and long life. They are dependable—mechanically and electrically simple. Rapid in response to thermocouple changes, with a guaranteed accuracy of ¼ of 1% of scale range. Some of the details explain why perfect records and Foxboro Pyrometers go hand-in-hand throughout industry. The Foxboro Company, 118 Neponset Avenue, Foxboro, Massachusetts, U. S. A. Branch offices in 25 Principal Cities.

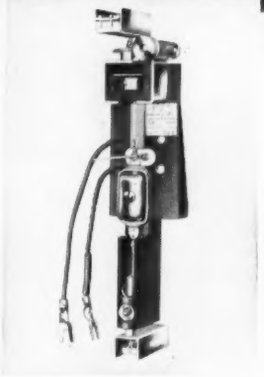
FOXBORO

REG. U. S. PAT. OFF.

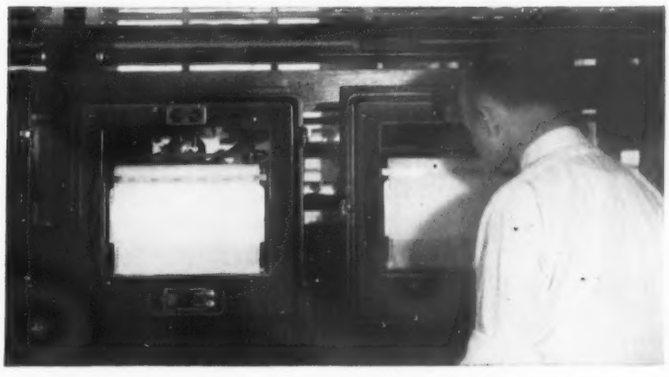
**PYROMETER RECORDERS**



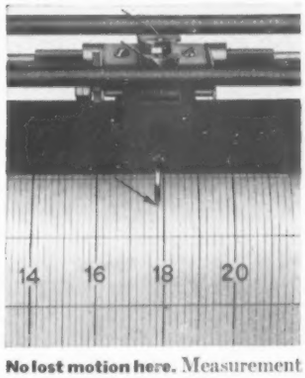
**Readily accessible** — entire mechanism can be seen and reached when required.



**Strong and sensitive galvanometer.** Every detail has been engineered to assure convenience . . . sensitivity . . . and freedom from breakage. Many improvements originated by Foxboro make it outstanding in assuring hairline accuracy. It has proved extremely dependable in thousands of installations.

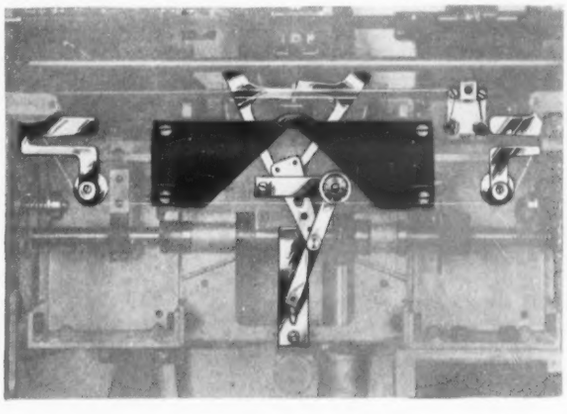


**Utmost visibility** on the single pen or multiple record Recorders is a feature that thousands of users enjoy. It makes for more accurate and more economical control. The easily-read 12-inch wide chart may show only one temperature—or as many as eight different temperatures.

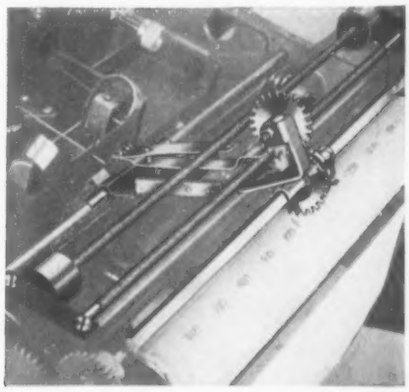



**No lost motion here.** Measurement and record are always accurate and identical. Slide wire contact and recording device are mounted and move as an integral unit.

**Thermocouples and accessories** are specifically designed to assure the most accurate detection of temperatures. We will gladly send you complete details upon request.



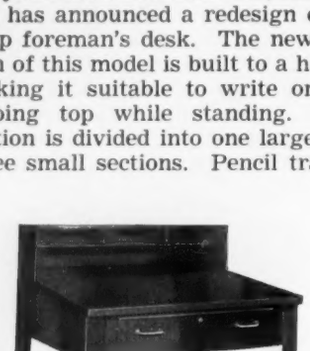
**Fast recording** with slow mechanical motion in the balancing mechanism banished noise . . . wear . . . and inaccuracy in all Foxboro Pyrometer Recorders.



**Uniform galvanometer sensitivity** at all points on the scale is assured by the unique Foxboro compensating slide wire. Balancing action and pen travel are uniform across the entire scale.

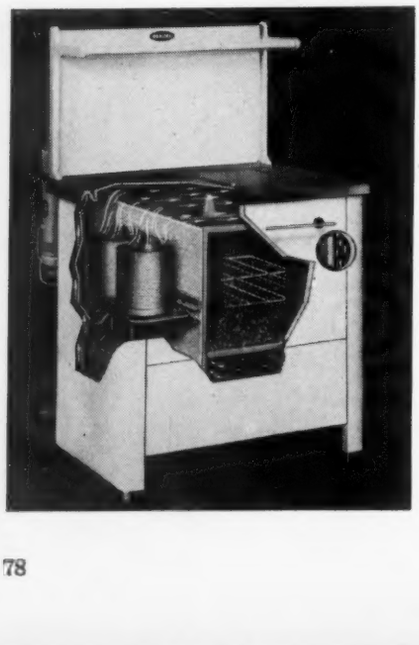
# NEW METAL PRODUCTS

■ Lyon Metal Products Inc., Aurora, Ill., has announced a redesign of its shop foreman's desk. The new version of this model is built to a height making it suitable to write on the sloping top while standing. Top section is divided into one large and three small sections. Pencil tray is



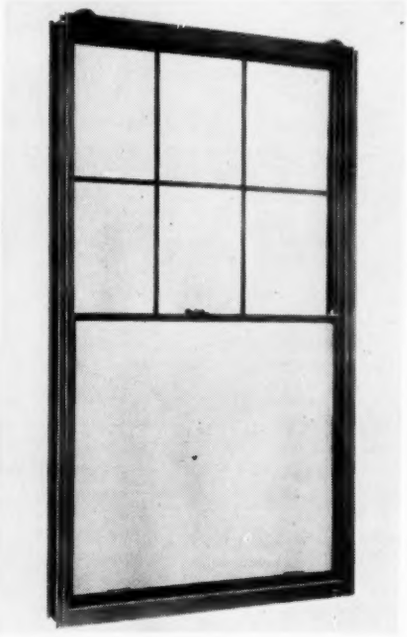
furnished and two hooks on right side. Drawer slides on roller bearings and is equipped with flat key lock. The desk is 36 inches wide, 30 inches deep and 52 inches high overall. In front it is 42 inches high.

■ Renown Stove Co., Owosso, Mich., has announced the new Streamliner oil burning range for homes utilizing fuel oil for heating. The new range is particularly designed to provide top cooking and baking facilities for large as well as small families. It also supplies heat when needed in kitchen or adjoining rooms. Improved operating economy is claimed to be made possible by effective insulation of the entire range. It is completely rustproofed and finished in white porcelain.



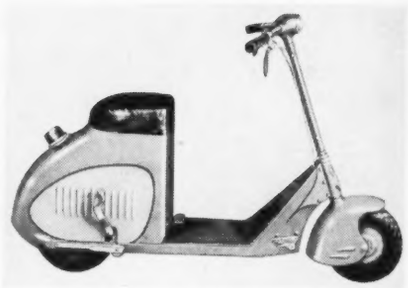
■ For converting an Emerson-Electric desk or wall bracket fan into an adjustable floor stand model, Emerson-Electric Mfg. Co., St. Louis, Mo., has brought out an adjustable floor stand. Fans can be attached to the new unit quickly and easily through the three mounting holes in the fan base. The stand is adjustable within the range of 3½ to 5 feet, floor to center of fan. The base and lower column are finished in black wrinkle enamel, the upper column in chromium plate and the stand plate in lustrous black enamel to match the fan. Unit is equipped with eight feet of rubber-covered extension cord and soft rubber plug.

■ Truscon Steel Co., Youngstown, O., has introduced a new double-hung, steel window for every type of residential construction. All sash members are of tubular construction,



adding strength, durability and a finished appearance to the window. Weights and cords are absent. Operation is controlled by spring balances equipped with tapes of Enduro stainless steel. Each window is completely factory weather-stripped with spring bronze. Hardware is a special design and available in brush cadmium finish as standard equipment or in Enduro stainless steel or solid bronze at slight extra charge.

■ Gasoline mileage of 120 per gallon is claimed for the new Moto-Scoot, a product of Moto-Scoot Mfg. Co., 215 South Western avenue, Chicago. The new vehicle is a 2-wheeled scooter, much like a child's sidewalk scooter,

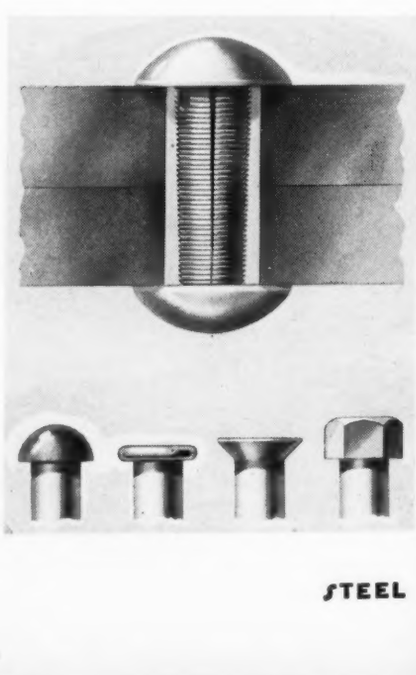


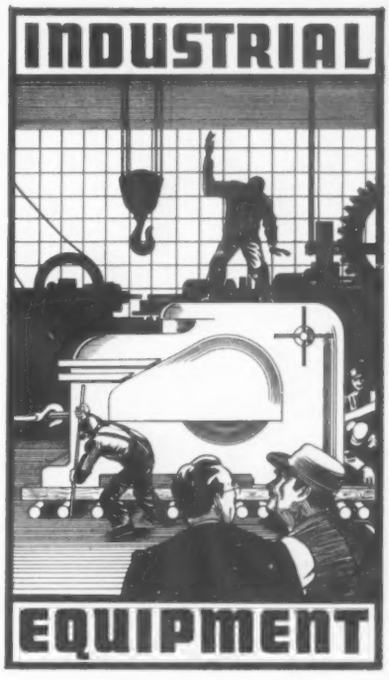
but substantially heavier, larger and motor-driven. It comes in sport, rear trunk and side trunk types, in both standard and de luxe models. For commercial uses the rear and side trunk models are manufactured while a tow bar for auto-pickup service may be had for any of the types. Speeds range up to 35 miles per hour.

■ Recently introduced by Hopkan Rivet Co. Inc., Pittsburgh, a new type metal fastener which operates on the rivet principle is designed for rivet applications where confined space or fragile materials are required, or where heating, hammering or upsetting is impractical.

These fasteners have a serrated split stud which locks within an internally serrated sleeve. The serrations, which are not threads, are formed with one vertical and one tapered face. When the stud is forced into the sleeve under pressure, the two halves of the stud spring together at the slot. The serrations of the stud then lock into the serrations of the sleeve so they cannot be disengaged under normal conditions.

A light hammer blow or compression with a press or strong pliers springs the stud at the split, locking the tapered serrations into the internal serrations. A solid connection is formed in one operation. The principle has been reversed for special operations.






## Less Floor Space For Polishing Lathe

■ Crown Rheostat & Supply Co., 1910 Maypole avenue, Chicago, has introduced a new polishing lathe designed so more men can be employed into a given amount of floor space than originally.

The unit, with a capacity of four men, has an actual floor space of 55 x 48 inches. It is driven by two motors, the two spindles of which may be of different speeds. Motors are mounted in the base of the lathe which also is provided with a ventilating system.

## Gasoline Torch Has 1-Pint Capacity

■ Unique Mfg. Co., 221 West Walton street, Chicago, has placed on the market a gasoline blow torch of 1-pint capacity to be used in places difficult to reach.

Tank of the torch is steel and the fittings brazed. The burner head

**Closing fuel valve of this Unique gasoline blow torch forces the steel cleaning needle through the orifice, clearing it of foreign particles**

is a bronze casting with removable orifice block and cleaning needle. It produces an intense heat of 1850 degrees Fahr. The unit weighs 3 pounds and the oval tank is 5 inches in diameter.

## Oil Power Motor Has Multiple Piston Action

■ Sandstrand Machine Tool Co., Rockford, Ill., has introduced a 2-speed oil power fluid motor of the multiple piston type designed for machine tool feed applications.

Two speeds of this motor permit using the low speed for the feed movements to slides, carriages and tables, while the high speed supplies rapid traverse.

A feed range from 3 to 120 revolutions per minute and a rapid traverse rate of 2000 revolutions per minute can be obtained by driving it with the same pumps used to provide feeding movements by means of a piston and cylinder. The feed rate is varied by adjusting the variable displacement feed pump, the rapid traverse remaining the constant.

The unit is known as the 4-MC model, and has a rating of 100-inch pounds per hundred pounds pressure for feed. It is small and compact, being 6½ inches in diameter across the face of the flange.

## Instrument Measures Gas-Air Mixtures

■ Davis Emergency Equipment Co., 55 Van Dam street, New York, has placed on the market a combustible gas indicator for measuring directly the combustibility and explodibility of gas-air mixtures.

The indicator weighs 6 pounds. Dimensions of its instrument panel are 6⅞ x 5⅝, and the depth of the case is 3¾ inches, making the unit easy to handle and carry around.

Current is supplied by two standard dry batteries which give 3½ hours of continuous operation, and when used intermittently, permit a large number of tests to be made before being renewed.

A 3-inch meter shows directly the percentage of the lower explosive limit of the mixture being sampled. It is mounted under the panel with only the scale showing, and is protected from damage by shatter-proof glass. Meter readings are changed to volts for checking purposes by means of a push-button. This can be accomplished while sampling is taking place.

## Bottle Conveyor Makes Two-Plane Bends

■ Link-Belt Co. 307 North Michigan avenue, Chicago, has introduced a 2-plane conveyor chain for handling bottles, jars or cans in the process of manufacture or in cleaning, filling or capping operations.

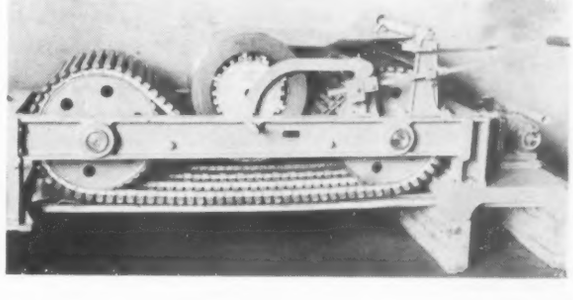
The chain permits sprocket engagement in two planes for travel in rectangular, circular, semicircular or irregular paths, using one continuous chain with only one driving mechanism. Use of cut tooth sprockets gives the unit a smooth conveyor movement.

## Coils Automatically Delivered by Reel

■ Waterbury Farrel Foundry & Macine Co., Waterbury, Conn., has placed on the market a heavy stock reel designed to unwind coils of metal and deliver it automatically at the desired speed to a roll feed press.

Unit is equipped with a special carrier built to protect the surface of brightly finished metal against injury. The carrier consists of four sprocket driven roller chains to which maple slats, reinforced by steel, are attached to form a cradle for supporting and unwinding coil. Carrier is 30 inches wide and is chain driven through a variable speed unit powered by means of a 1-horsepower motor.

The unit also employs a guide to keep metal in its proper path as it passes between a pair of driven



**Waterbury Farrel heavy stock reel has a carrier 30 inches wide and is chain driven. Illustrated unit has a capacity for metal 28 inches wide wound in coils 48 inches in diameter**

rolls. These rolls deliver stock at a speed slightly greater than the feed of the press working in conjunction with it. The metal passes under a feeder roll which is extended from the reel proper and then to the press feed.

Position of the extending feeder roll arm operates a mercury switch. Whenever there is sufficient slack to permit the arm to drop down, the motor is switched off, and when this slack is taken up by the press feed, the arm is lifted and motor switched on. This causes the reel to again start unwinding.

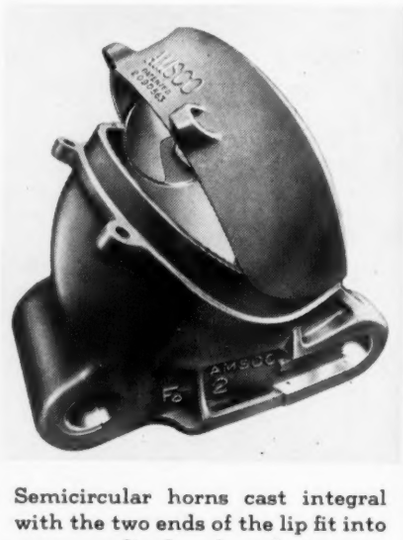
## Punch Mounted on One-Piece Bracket

■ Ingersoll-Rand Co., 11 Broadway, New York, has placed on the market a new shank and bit punch which handles bits and shanks on all commercial sizes and sections of drill steel.

Punch is mounted on a sturdy one-piece bracket. The convenient location of operating levers, safety guard for punch and improved design, facilitating inspection and reducing breakage of punch pins are among the other features.

## Dredge Buckets Have Removable Lips

■ American Manganese Steel division American Brake Shoe & Foundry Co., 956 Ferry street, Oakland, Calif., has placed on the market a rivetless dredge bucket, the lip of which is removable but still retains the rigidity of a one piece bucket.



**Semicircular horns cast integral with the two ends of the lip fit into correspondingly shaped recesses in the body of this American Manganese Steel rivetless dredge bucket**

This is accomplished by seating the lip so it is interlocked with the body. Semicircular horns cast integral with the two ends of the lip fit into correspondingly shaped recesses in the body. A flange on the lip fitting down snugly over the hood rim prevents side-sway and lip distortion and provides a positive locking device and non-obstructing union between body and lip.

Wedge-head bolts are inserted vertically through lugs cast integral with the lip and bucket. These bolt heads fit snugly into correspondingly shaped recesses in the lip lugs thereby providing constant tension. T-shaped pins hold the bearings of the bucket in place and also join the links together. The pins are held in position by one arm of the T being bolted to the link.

## Variable Speed Pulley Fits Standard Shaft

■ Lewellen Mfg. Co., Columbus, Ind., has placed on the market a

"THE MACHINES THAT PUT THE 'RINGS' IN SPRINGS"
SLEEPER AND HARTLEY INC.
WORCESTER MASSACHUSETTS U.S.A.
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MORE AUTOMATIC SPRING MAKING MACHINES HAVE BEEN MADE BY
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WORCESTER, MASSACHUSETTS
THAN BY ALL OTHER MANUFACTURERS IN
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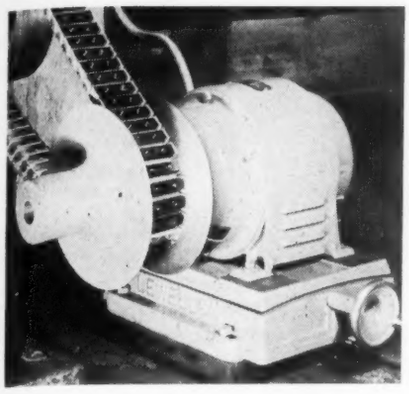


**Uniform low spring pressures at all pulley diameters of this Lewellen variable speed motor pulley eliminate belt buckling**

variable speed motor pulley which fits the shaft of a standard motor and drives directly to a pulley or sheave on the driven shaft.

Both motor and pulley are mounted on an adjustable base thus permitting infinite variations of speed of the driven shaft. The unit has a positive equalized disc travel in both directions, maintaining the belt in the same position at all diameters. Uniform low spring pressures at all pulley diameters eliminate belt buckling. Driving members of the unit are of hardened steel. A pressure lubrication system takes care of the enclosed bearing surfaces.

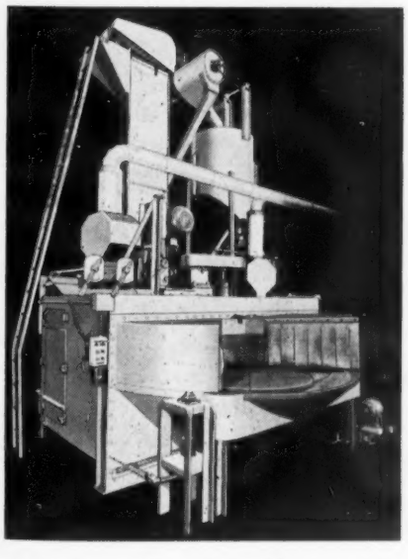
## Machine's Action Cleans Stove Plate

■ American Foundry Equipment Co., 555 Byrkit street, Mishawaka, Ind., has introduced a new model Wheelabrator Tablast for handling both rough blasting and finish blasting operations required for cleaning stove plate prior to enameling, painting and japanning.

Action of the machine centers around the airless abrasive blasting unit. Two of these are mounted in such a position that work passing through the blasting zone is completely showered by a continuous blast of steel shot or grit.

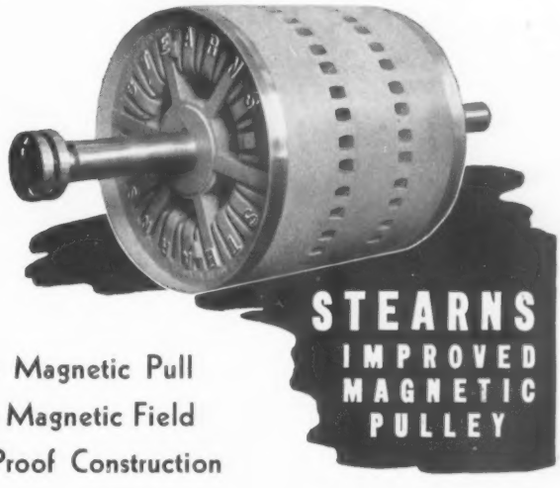
Abrasive is fed by gravity from an overhead storage hopper to the center of the bladed wheel, from which it is hurled by centrifugal force, but under directional control. After striking work, abrasive drops into a hopper feeding to a bucket elevator which raises the abrasive to a point above the machine where refuse, scrap metal and other foreign material are screened out. Next the abrasive passes through a sand separator which removes sand in the metallic abrasive.

Work to be cleaned in the machine is carried through the cabinet on four tables each 48 inches in diameter. Tables are mounted on a main spider which carries them in and out of the cleaning cabinet. Rubber covering over the tables shields metallic surfaces from blasting wear.



**American Foundry Equipment Wheelabrator Tablast is fed abrasive by gravity from an overhead storage hopper**


**COOL** *Because it's Ventilated* **in operation resulting in longer life and uniform power.**

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## New Truss Designed

(*Concluded from Page 62*)

be suspended from rails fastened at the top of the truss, thus reducing overall height required.

Developed by engineers of the Austin Co., Cleveland, this new truss construction eliminates diagonal members and so permits installation of conveyors, ducts and other equipment and devices in subceiling areas otherwise useless. In addition, this design allows installation of monorail hoists and carriers directly on the bottom chord of the truss, and eliminates necessity of providing a special member below the truss as in conventional designs. The portal truss permits this because of its capacity for carrying concentrated loads between panel points.

Unusual in many directions is the materials handling system to be employed at the International Agricultural Corp. plant. In one of the accompanying illustrations, an overhead conveyor belt is shown above the portal truss with a vertical conveyor to the horizontal belt installed in vertical ducts at both ends. Material is transported on the vertical conveyor to the horizontal belt unit at the top and from there it is discharged into hoppers. The latter in turn load the tram cars which deliver to stock piles below.

**New truss design permits hoists to be suspended directly from bottom section of truss as shown in this steel fabricating shop**

•

## Tests Value of Hardness As Aid to Cylinder Life

■ "We do not believe it has been proved that the hardest material is always the best to use on all kinds of engines where first cost, use to which the engine is put, and other factors are considered," said L. B. Sperry, International Harvester Co., Chicago, in a paper presented at the April meeting of the Society of Automotive Engineers in Milwaukee. Additional comment included description on an interesting series of tests.

Forty-six tests, covering about 12,000 hours of actual field operation, showed some interesting things about cylinder wear. Most of these tests were made with four cylinders of the same material on each test using so-called wet-cylinder sleeves. Materials included nitrided cast-iron cylinder sleeves, reported to be 900 brinell; various alloys of chromium, nickel and molybdenum; and chilled iron with different amounts of nickel and chromium.

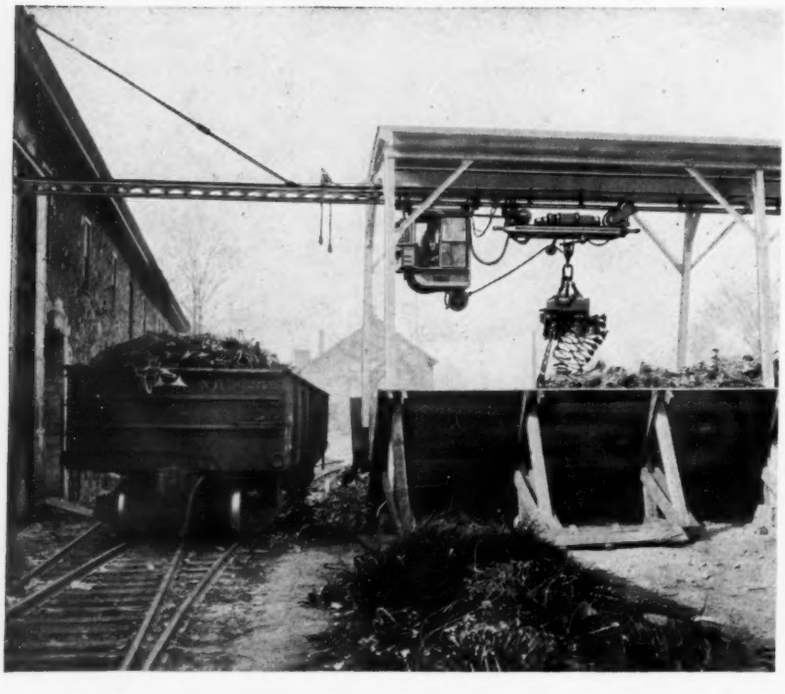
These tests indicated the hardest material was not the best to use; in fact, the lowest rate of wear was on a material of 250 brinell. However, the material with lowest rate of wear was not necessarily the best as this particular material was not only expensive to produce but was difficult to hone and had a tendency to scuff easily.

Average rate of wear on 27 tests of 250 hours each on the same material in a heat treated and un-heat treated condition showed four times the rate of wear on the un-heat treated material. The best future material appears to be one fairly hard, over 500 brinell. Use of nitrided, thin dry cylinders, 1000 brinell, is a recent development of considerable interest.

CLEVELAND TRAMRAIL

MATERIALS HANDLING EQUIPMENT

In the Metal Working Industry



• Jib cranes are efficient equipment for extending Cleveland Tramrail over railroad tracks or for servicing cars and loading docks.

• Moving of scrap from the shop floor to storage bins or car is done inexpensively with a cab controlled carrier and electro magnet.

ALSO BUILDERS OF CLEVELAND CRANES FOR EVERY INDUSTRY

CLEVELAND TRAMRAIL

THE CLEVELAND CRANE & ENGINEERING CO.

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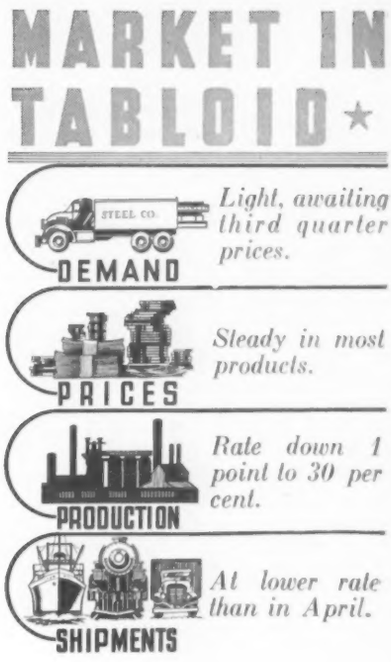
Or consult your phone directory under Cleveland Tramrail.

# Plate, Structural Work Pends, Promises Upturn

## Third Quarter Prices Awaited; Scrap at Apparent Bottom




■ STEEL buying shows no signs of improving. The situation is complicated by the general tendency to await announcement of prices for third quarter.

A year ago steelmakers made their announcement for third quarter April 21, during a wave of heavy buying. Buyers feel they have nothing to lose and the possibility of gain if prices should be reduced. No definite intimation has been given as to the result. High wage rates enter into the picture, some steelmakers asserting reduced steel prices must be accompanied by lower wages.

Developments in the plate and structural markets give promise of better mill activity in the summer and fall as pending work accumulates and ship tonnage is placed, on which deliveries will keep pace with construction. Tankers, cargo ships and navy work aggregate a large tonnage which will spread over several months. New York is considering bids on 30 dump scows which will require 9000 tons of plates and shapes, for fairly prompt delivery.

Prospective work involving structural steel includes a number of fairly large lots, some of which are near closing. Manhattan land section of the Queens-Midtown tunnel at New York will require 6500 tons and repair and widening of George Washington bridge 1560 tons. The Delaware aqueduct will take 14,750 tons for shafts and tunnels. Tennessee Valley authority is inquiring for 2200 tons of transmission towers and 1200 tons for a powerhouse. A manufacturing building at Toledo, O., involves 1500 tons and a mercantile warehouse at Washington 1400 tons. Main avenue bridge at Cleveland has been awarded, 8175 tons of steel.

Railroads evince little interest in buying either rails or rolling stock, the order by the Southern railway being the only one recently. An indication of the situation is found in the fact that only 15 freight cars were placed in April, the smallest monthly total since May, 1935, when only two were bought.

Placing of 10,967 tons of rails by the Erie constitutes the only rail business recently. Most rail buying has been for immediate delivery and mills are operating steadily at a low rate, with business for 30 to 60 days.

Operations dropped 1 point to 30 per cent last week, with indications for this week not clear. There was no change of rate at Pittsburgh at 25 per cent, Eastern Pennsylvania 27.5, Buffalo 28, Birmingham 66, New England 30 and Detroit 18. At Chicago there was a loss of 1 point to 31.5 per cent, at Youngstown 3 points to 27, Wheeling 3 points to 38, Cleveland 5 points to 23, St. Louis 3 points to 33.3 and Cincinnati 15 points to 25.

Automobile production declined 5970 to 47,415 units the lowest weekly output since the 1938 model season got under way. General Motors produced 20,000 units, compared with 23,285 the week before; Chrysler fell to 9850 from 11,400; Ford assembled 12,385, compared with 11,885; and the independents produced 4980, compared with 6815.

Shipments of finished steel by the United States Steel Corp. in April were 501,972 tons, 12.2 per cent less than in March and 62.6 per cent less than April last year. Four months' shipments this year total 2,067,216 tons, 59 per cent less than 5,041,685 tons shipped in the corresponding months of 1937.

Great Britain has reimposed an import duty of 33 1/3 per cent on all pig iron from abroad, except charcoal and some special grades and the government is considering accumulation of stocks for emergencies, in an effort to aid the declining demand for domestic use. Production of pig iron and steel both fell off in April.

For the first time since the abortive rise in mid-March the composite of steelmaking scrap prices failed to decline last week, holding at $11.59. Resistance has been developing and an apparent bottom has been reached. The iron and steel and the finished steel composites were unchanged.

# COMPOSITE MARKET AVERAGES

| | May 14 | May 7 | April 30 | One Month Ago April, 1938 | Three Months Ago Feb., 1938 | One Year Ago May, 1937 | Five Years Ago May, 1933 |
|---|---|---|---|---|---|---|---|
| Iron and Steel .... | $38.52 | $38.52 | $38.54 | $38.61 | $38.90 | $40.06 | $28.33 |
| Finished Steel .... | 61.70 | 61.70 | 61.70 | 61.70 | 61.70 | 61.70 | 45.10 |
| Steelworks Scrap.. | 11.59 | 11.59 | 11.71 | 12.30 | 13.54 | 18.49 | 9.23 |

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

# COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

## Finished Material

| | May 14, 1938 | April 1938 | Feb. 1938 | May 1937 |
|---|---|---|---|---|
| Steel bars, Pittsburgh | 2.45c | 2.45c | 2.45c | 2.45c |
| Steel bars, Chicago | 2.50 | 2.50 | 2.50 | 2.50 |
| Steel bars, Philadelphia | 2.77 | 2.765 | 2.75 | 2.74 |
| Iron bars, Terre Haute, Ind. | 2.35 | 2.35 | 2.35 | 2.35 |
| Shapes, Pittsburgh | 2.25 | 2.25 | 2.25 | 2.25 |
| Shapes, Philadelphia | 2.465 | 2.465 | 2.465 | 2.455 |
| Shapes, Chicago | 2.30 | 2.30 | 2.30 | 2.30 |
| Tank plates, Pittsburgh | 2.25 | 2.25 | 2.25 | 2.25 |
| Tank plates, Philadelphia | 2.445 | 2.445 | 2.445 | 2.435 |
| Tank plates, Chicago | 2.30 | 2.30 | 2.30 | 2.30 |
| Sheets, No. 10, hot rolled, Pitts. | 2.40 | 2.40 | 2.40 | 2.40 |
| Sheets, No. 24, hot ann., Pitts. | 3.15 | 3.15 | 3.15 | 3.15 |
| Sheets, No. 24, galv., Pitts. | 3.80 | 3.80 | 3.80 | 3.80 |
| Sheets, No. 10, hot rolled, Gary | 2.50 | 2.50 | 2.50 | 2.50 |
| Sheets, No. 24, hot anneal., Gary | 3.25 | 3.25 | 3.25 | 3.25 |
| Sheets, No. 24, galvan., Gary | 3.90 | 3.90 | 3.90 | 3.90 |
| Plain wire, Pittsburgh | 2.90 | 2.90 | 2.90 | 2.90 |
| Tin plate, per base box, Pitts. | $5.35 | 5.35 | 5.35 | 5.35 |
| Wire nails, Pittsburgh | 2.75 | 2.75 | 2.75 | 2.75 |

## Semifinished Material

| | | | | |
|---|---|---|---|---|
| Sheet bars, open-hearth, Youngs. | $37.00 | $37.00 | $37.00 | $37.00 |
| Sheet bars, open-hearth, Pitts. | 37.00 | 37.00 | 37.00 | 37.00 |
| Billets, open-hearth, Pittsburgh | 37.00 | 37.00 | 37.00 | 37.00 |
| Wire rods, No. 5 to 9/32-inch, Pitts. | 47.00 | 47.00 | 47.00 | 47.00 |

## Pig Iron

| | May 14, 1938 | April 1938 | Feb. 1938 | May 1937 |
|---|---|---|---|---|
| Bessemer, del. Pittsburgh | $25.34 | $25.30 | $25.26 | $25.26 |
| Basic, Valley | 23.50 | 23.50 | 23.50 | 23.50 |
| Basic, eastern del. East. Pa. | 25.34 | 25.34 | 25.34 | 25.26 |
| No. 2 fdry., Pittsburgh | 25.21 | 25.21 | 25.21 | 25.21 |
| No. 2 fdry., Chicago | 24.00 | 24.00 | 24.00 | 24.00 |
| Southern No. 2, Birmingham | 20.38 | 20.38 | 20.38 | 20.38 |
| Southern No. 2, del. Cincinnati | 23.89 | 23.89 | 23.89 | 23.69 |
| No. 2X eastern, del. Philadelphia | 26.215 | 26.215 | 26.215 | 26.135 |
| Malleable, Valley | 24.00 | 24.00 | 24.00 | 24.00 |
| Malleable, Chicago | 24.00 | 24.00 | 24.00 | 24.00 |
| Lake Sup., charcoal, del. Chicago | 30.34 | 30.34 | 30.24 | 30.04 |
| Gray forge, del. Pittsburgh | 24.17 | 24.17 | 24.17 | 24.17 |
| Ferromanganese, del. Pittsburgh | 107.77 | 107.77 | 107.49 | 107.29 |

## Scrap

| | | | | |
|---|---|---|---|---|
| Heavy melting steel, Pittsburgh | $11.75 | $12.70 | $14.15 | $19.55 |
| Heavy melt. steel, No. 2, E. Pa. | 10.25 | 11.55 | 13.25 | 16.85 |
| Heavy melting steel, Chicago | 11.25 | 11.45 | 12.15 | 17.55 |
| Rails for rolling, Chicago | 14.75 | 15.25 | 15.25 | 21.45 |
| Railroad steel specialties, Chicago | 13.75 | 13.75 | 14.85 | 21.35 |

## Coke

| | | | | |
|---|---|---|---|---|
| Connellsville, furnace, ovens | $4.25 | $4.25 | $4.25 | $4.85 |
| Connellsville, foundry, ovens | 5.25 | 5.25 | 5.25 | 5.30 |
| Chicago, by-product foundry, del. | 11.00 | 11.00 | 11.00 | 11.00 |

# STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

*Except when otherwise designated, prices are base, f.o.b. cars.*

## Sheet Steel

**Subject to Quantity Extras and deductions (Except Galv.)**

**Hot Rolled No. 10, 24-48 in.**

| | |
|---|---|
| Pittsburgh | 2.40c |
| Gary | 2.50c |
| Chicago, delivered | 2.53c |
| Detroit, del. | 2.60c |
| New York, del. | 2.76c |
| Philadelphia, del. | 2.72c |
| Birmingham | 2.55c |
| St. Louis, del. | 2.63c |
| Granite City, Ill. | 2.60c |
| Pac. base pts. f.o.b. cars, dock, | 2.95c |

**Hot Rolled Annealed No. 24**

| | |
|---|---|
| Pittsburgh | 3.15c |
| Gary | 3.25c |
| Chicago, delivered | 3.28c |
| Detroit, delivered | 3.35c |
| New York, delivered | 3.51c |
| Philadelphia, del. | 3.47c |
| Birmingham | 3.30c |
| St. Louis, del. | 3.38c |
| Granite City, Ill. | 3.35c |
| Pac. base pts. f.o.b. cars, dock, | 3.80c |

**Galvanized No. 24**

| | |
|---|---|
| Pittsburgh | 3.80c |
| Gary | 3.90c |
| Chicago, delivered | 3.93c |
| Philadelphia, del. | 4.12c |
| New York, delivered | 4.16c |
| Birmingham | 3.95c |
| St. Louis, del. | 4.03c |
| Granite City, Ill. | 4.00c |
| Pac. base pts. f.o.b. cars, dock, | 4.40c |

**Tin Mill Black No. 28**

| | |
|---|---|
| Pittsburgh | 3.30c |
| Gary | 3.40c |
| St. Louis, delivered | 3.53c |
| Granite City, Ill. | 3.50c |

**Cold Rolled No. 10**

| | |
|---|---|
| Pittsburgh | 3.00c |
| Gary | 3.10c |
| Detroit, delivered | 3.20c |
| Philadelphia, del. | 3.32c |
| New York, del. | 3.36c |
| St. Louis, del. | 3.23c |
| Granite City, Ill. | 3.20c |
| Pac. base pts. f.o.b. cars, dock, | 3.60c |

**Cold Rolled No. 20**

| | |
|---|---|
| Pittsburgh | 3.45c |
| Gary | 3.55c |
| Detroit, delivered | 3.65c |
| Philadelphia, del. | 3.77c |
| New York, del. | 3.81c |
| St. Louis | 3.68c |
| Granite City, Ill. | 3.65c |

**Enameling Sheets**

| | |
|---|---|
| Pittsburgh, No. 10 | 2.90c |
| Pittsburgh, No. 20 | 3.50c |
| Gary, No. 10 | 3.00c |
| Gary, No. 20 | 3.60c |
| St. Louis, No. 10 | 3.13c |
| St. Louis, No. 20 | 3.73c |

## Tin and Terne Plate

Gary base, 10 cents higher

| | |
|---|---|
| Tin plate, coke (base box) Pittsburgh | $5.35 |
| Waste-waste, 2.80c; strip | 2.50c |
| Long ternes, No. 24, unassorted, Pittsburgh | 4.10c |

## Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

**Chrome-Nickel**

| | No. 302 | No. 304 |
|---|---|---|
| Bars | 24.00 | 25.00 |
| Plates | 27.00 | 29.00 |
| Sheets | 34.00 | 36.00 |
| Hot strip | 21.50 | 23.50 |
| Cold strip | 28.00 | 30.00 |

**Straight Chromes**

| | No. 410 | No. 430 | No. 442 | No. 446 |
|---|---|---|---|---|
| Bars | 18.50 | 19.00 | 22.50 | 27.50 |
| Plates | 21.50 | 22.00 | 25.50 | 30.50 |
| Sheets | 26.50 | 29.00 | 32.50 | 36.50 |
| Hot strip | 17.00 | 17.50 | 23.00 | 28.00 |
| Cold stp. | 22.00 | 22.50 | 28.50 | 36.50 |

## Steel Plate

| | |
|---|---|
| Pittsburgh | 2.25c |
| New York, del. | 2.55c |
| Philadelphia, del. | 2.44½c |
| Boston, delivered | 2.68c |
| Buffalo, delivered | 2.49½c |
| Chicago or Gary | 2.30c |
| Cleveland, del. | 2.45½c |
| Birmingham | 2.40c |
| Coatesville, base | 2.35c |
| Sparrows Pt., base | 2.35c |
| St. Louis, delivered | 2.54c |
| Pacific basing points, f.o.b. cars, dock, | 2.80c |
| Do. floor plates | 4.05c |

## Structural Shapes

| | |
|---|---|
| Pittsburgh | 2.25c |
| Philadelphia, del. | 2.46½c |
| New York, del. | 2.52c |
| Boston, delivered | 2.66c |
| Bethlehem | 2.35c |
| Chicago | 2.30c |
| Cleveland, del. | 2.46c |
| Buffalo, delivered | 2.37½c |
| Gulf Ports | 2.66c |
| Birmingham | 2.40c |
| St. Louis, del. | 2.54c |
| Pacific coast basing pts., f.o.b. cars dock, | 2.80c |

## Bars

**Soft Steel**

(Base, 3 to 25 tons)

| | |
|---|---|
| Pittsburgh | 2.45c |
| Chicago or Gary | 2.50c |
| Duluth | 2.60c |
| Birmingham | 2.60c |
| Cleveland | 2.50c |
| Buffalo | 2.55c |
| Detroit, delivered | 2.60c |
| Philadelphia, del. | 2.77c |
| Boston, delivered | 2.89c |
| New York, del. | 2.81c |
| Pacific coast basing pts., f.o.b. cars, dock, | 3.00c |

**Rail Steel**

To Manufacturing Trade

| | |
|---|---|
| Pittsburgh | 2.30c |
| Chicago or Gary | 2.35c |
| Cleveland | 2.35c |
| Moline, Ill. | 2.35c |
| Buffalo, delivered | 2.37½c |
| Birmingham | 2.45c |

**Iron**

| | |
|---|---|
| Terre Haute, Ind. | 2.35c |
| Chicago | 2.40c |
| Philadelphia | 2.67c |
| Pittsburgh, refined | 3.50-8.00c |

**Reinforcing**

New billet, straight lengths, quoted by distributors

| | |
|---|---|
| Pittsburgh | 2.45c |
| Chicago, Gary, Buffalo, Cleve., Birm., Young. | 2.50c |
| Gulf ports | 2.85c |
| Pacific coast ports, f.o.b. car docks | 2.95c |
| Philadelphia, del. | 2.77c |

Rail steel, straight lengths, quoted by distributors

| | |
|---|---|
| Pittsburgh | 2.30c |
| Chicago, Buffalo, Cleveland, Birm., Young. | 2.35c |
| Gulf ports | 2.70c |

## Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

| | |
|---|---|
| Standard wire nails | $2.75 |
| Cement coated nails | $2.75 |

(Per pound)

| | |
|---|---|
| Polished staples | 3.45c |
| Galv. fence staples | 3.70c |
| Barbed wire, galv. | 3.40c |
| Annealed fence wire | 3.15c |
| Galv. fence wire | 3.55c |
| Woven wire fencing (base C. L. column) | .74 |
| Single loop bale ties, (base C. L. column) | .63 |

**To Manufacturing Trade**

| | |
|---|---|
| Plain wire, 6-9 ga. | 2.90c |
| Galvanized wire | 2.95c |
| Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3. | |
| Spring wire, Pittsburgh or Cleveland | 3.50c |
| Do., Chicago up $1, Worc. $2. | |

## Cold-Finished Carbon Bars, Shafting

| | |
|---|---|
| Pittsburgh | 2.90c |
| Chicago | 2.95c |
| Gary, Ind. | 2.95c |
| Detroit | 2.95c |
| Cleveland | 2.95c |
| Buffalo | 3.00c |

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

## Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

| | |
|---|---|
| Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem | 3.00c |

| S.A.E. | Alloy Diff. | S.A.E. | Alloy Diff. |
|---|---|---|---|
| 2000 | 0.35 | 3100 | 0.70 |
| 2100 | 0.75 | 3200 | 1.35 |
| 2300 | 1.55 | 3300 | 3.80 |
| 2500 | 2.25 | 3400 | 3.20 |
| 4100 0.15 to 0.25 Mo. | | | 0.55 |
| 4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. | | | 1.10 |
| 5100 0.80-1.10 Cr. | | | 0.45 |
| 5100 Cr. spring | | | 0.15 |
| 6100 bars | | | 1.20 |
| 6100 spring | | | 0.85 |
| Cr. N., Van. | | | 1.50 |
| Carbon Van. | | | 0.85 |
| 9200 spring flats | | | 0.15 |
| 9200 spring rounds, squares | | | 0.40 |

## Piling

| | |
|---|---|
| Pittsburgh | 2.60c |
| Chicago, Buffalo | 2.70c |
| Pacific basing pts. f.o.b. cars, dock | 3.05c |

## Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

| | |
|---|---|
| Hot strip to 23⅛-in. | |
| Pittsburgh | 2.40c |
| Chicago or Gary | 2.50c |
| Birmingham base | 2.55c |
| Detroit, del. | 2.60c |
| Philadelphia, del. | 2.72c |
| New York, del. | 2.76c |
| Cooperage hoop, | |
| Pittsburgh | 2.50c |
| Chicago | 2.60c |
| Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland | 3.20c |
| Detroit, del. | 3.41c |
| Worcester, Mass. | 3.40c |

| Carbon | Cleve. Pitts. | Worcester, Mass. |
|---|---|---|
| 0.26—0.50 | 3.20c | 4.30c |
| 0.51—0.75 | 4.45c | 4.65c |
| 0.76—1.00 | 6.30c | 6.50c |
| Over 1.00 | 8.50c | 8.70c |

## Rails, Track Material

(Gross Tons)

| | |
|---|---|
| Standard rails, mill | $42.50 |
| Relay rails, Pittsburgh 20—100 lbs. | 32.50-35.50 |
| Light rails, billet qual., Pittsburgh, Chicago | $43.00 |
| Do., rerolling quality | 42.00 |
| Angle bars, billet, Gary, Pittsburgh, So. Chicago | 2.80c |
| Do., axle steel | 2.35c |
| Spikes, R. R. base | 3.15c |
| Track bolts, base | 4.35c |
| Car axles forged, Pitts., Chgo., B'ham. | 3.35c |
| Tie plates, base | $46.00 |

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

## Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up:

**Carriage and Machine**

| | |
|---|---|
| ½ x 6 and smaller | 65-5 off |
| Do. larger, to 1-in. | 60-10 off |
| Do. 1⅛ and 1¼-in. | 60-5 off |
| Tire bolts | 50 off |

**Stove Bolts**

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

| | |
|---|---|
| Step bolts | 50-10-5 off |
| Elevator bolts | 50-10-5 off |

**Nuts**

| | |
|---|---|
| S. A. E. semifinished hex.: ½ to $\frac{7}{16}$-inch | 60-10 off |
| Do., $\frac{1}{2}$ to 1-inch | 60-5 off |
| Do., over 1-inch | 60 off |

**Hexagon Cap Screws**

| | |
|---|---|
| Milled | 50-10 off |
| Upset, 1-in., smaller | 70-5 off |

**Square Head Set Screws**

| | |
|---|---|
| Upset, 1-in., smaller | 80-5 off |
| Headless set screws | 75 off |

## Rivets, Wrought Washers

| | |
|---|---|
| Structural, Pittsburgh, Cleveland | 3.60c |
| Structural, Chicago | 3.70c |
| $\frac{7}{16}$-inch and smaller, Pitts., Chi., Cleve. | 65-5 off |
| Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 | off |

## Cut Nails

| | |
|---|---|
| Cut nails, C. L. Pitts. (10% disc. on all extras) | $3.60 |
| Do., less carloads, 5 kegs or more, no discount on any extras | $3.90 |
| Do., under 5 kegs no disc. on any extras | $4.05 |

## Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

**Butt Weld**

| In. | Steel Blk. | Steel Galv. |
|---|---|---|
| ½ | 59½ | 49 |
| ¾ | 62½ | 53 |
| 1—3 | 64½ | 55½ |
| Iron | | |
| ¾ | 26 | 8 |
| 1—1¼ | 30 | 14 |
| 1½ | 34 | 16½ |
| 2 | 33½ | 16 |

**Lap Weld**

| | Steel | |
|---|---|---|
| 2 | 57 | 47½ |
| 2½—3 | 60 | 50½ |
| 3½—6 | 62 | 52½ |
| 7 and 8 | 61 | 50½ |
| 9 and 10 | 60½ | 50 |
| 11 and 12 | 59½ | 49 |
| Iron | | |
| 2 | 26½ | 10 |
| 2½—3½ | 27½ | 12½ |
| 4 | 29½ | 16 |
| 4½—8 | 28½ | 15 |
| 9—12 | 24½ | 10 |

**Line Pipe**

| | Steel | |
|---|---|---|
| 1 to 3, butt weld | 63½ | |
| 2, lap weld | 56 | |
| 2½ to 3, lap weld | 59 | |
| 3½ to 6, lap weld | 61 | |
| 7 and 8, lap weld | 60 | |
| 10-inch lap weld | 59½ | |
| 12-inch, lap weld | 58½ | |
| Iron | | |
| | Blk. | Galv. |
| ¾ butt weld | 25 | 7 |
| 1 and 1¼ butt weld | 29 | 13 |
| 1½ butt weld | 33 | 15½ |
| 2 butt weld | 32½ | 15 |
| 1½ lap weld | 23½ | 7 |
| 2 lap weld | 25½ | 9 |
| 2½ to 3½ lap weld | 26½ | 11½ |
| 4 lap weld | 28½ | 15 |
| 4½ to 8 lap weld | 27½ | 14 |
| 9 to 12 lap weld | 23½ | 9 |

## Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

**Lap Weld**

| Sizes | Steel | Charcoal Iron |
|---|---|---|
| 1½" OD x 13 Ga. | $10.45 | $23.71 |
| 1¾" OD x 13 Ga. | 11.89 | 22.93 |
| 2" OD x 13 Ga. | 13.31 | 19.35 |
| 2" OD x 11 Ga. | 15.49 | 23.36 |
| 2¼" OD x 13 Ga. | 14.82 | 21.68 |
| 2¼" OD x 11 Ga. | 17.38 | 26.02 |
| 2½" OD x 12 Ga. | 17.82 | 26.57 |
| 2¾" OD x 12 Ga. | 18.86 | 29.00 |
| 3" OD x 12 Ga. | 19.73 | 31.36 |
| 3½" OD x 11 Ga. | 24.89 | 39.81 |
| 4" OD x 10 Ga. | 30.81 | 49.90 |
| 5" OD x 9 Ga. | 47.57 | 73.93 |
| 6" OD x 7 Ga. | 73.25 | .... |

**Seamless**

| | Hot Rolled | Cold Drawn |
|---|---|---|
| 1" OD x 13 Ga. | $ 8.41 | $ 9.46 |
| 1¼" OD x 13 Ga. | 9.96 | 11.21 |
| 1½" OD x 13 Ga. | 11.00 | 12.38 |
| 1¾" OD x 13 Ga. | 12.51 | 14.09 |
| 2" OD x 13 Ga. | 14.02 | 15.78 |
| 2¼" OD x 13 Ga. | 15.63 | 17.60 |
| 2¼" OD x 12 Ga. | 17.21 | 19.37 |
| 2½" OD x 12 Ga. | 18.89 | 21.22 |
| 2¾" OD x 12 Ga. | 19.98 | 22.49 |
| 3" OD x 12 Ga. | 20.97 | 23.60 |
| 4½" OD x 10 Ga. | 40.15 | 45.19 |
| 3½" OD x 11 Ga. | 26.47 | 29.79 |
| 4" OD x 10 Ga. | 32.83 | 36.94 |
| 5" OD x 9 Ga. | 50.38 | 56.71 |
| 6" OD x 7 Ga. | 77.35 | 87.07 |

## Cast Iron Water Pipe

*Class B Pipe—Per Net Ton*

| | |
|---|---|
| 6-in., & over, Birm. | $46.00-47.00 |
| 4-in., Birmingham | 49.00-50.00 |
| 4-in., Chicago | 57.80-58.80 |
| 6 to 24-in., Chicago | 54.80-55.80 |
| 6-in. & over, east fdy. | 50.00 |
| Do., 4-in. | 53.00 |

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

## Semifinished Steel

**Billets and Blooms**

*Rerolling Quality*

4 x 4-*inch base; gross ton*

| | |
|---|---|
| Pitts., Chi., Cleve., Buffalo, Young., Birm. | $37.00 |
| Philadelphia | 42.83 |
| Duluth | 39.00 |

**Forging Quality Billets**

6 x 6 *to* 9 x 9-*in., base*

| | |
|---|---|
| Pitts., Chicago, Buffalo | 43.00 |
| Forging, Duluth | 45.00 |

**Sheet Bars**

| | |
|---|---|
| Pitts., Cleveland, Young., Sparrows Point | 37.00 |

**Slabs**

| | |
|---|---|
| Pitts., Chicago, Cleveland, Youngstown | 37.00 |

**Wire Rods**

| | |
|---|---|
| Pitts., Cleveland, No. 5 to $\frac{9}{32}$-inch incl. | 47.00 |
| Do., over $\frac{9}{32}$ to $\frac{41}{64}$-in. incl. | 52.00 |
| Chicago up $1; Worcester up $2. | |

**Skelp**

| | |
|---|---|
| Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt. | 2.10c |

## Coke

*Price Per Net Ton*

**Beehive Ovens**

| | |
|---|---|
| Connellsville, fur. | $4.00- 4.50 |
| Connellsville, fdry. | 5.00- 5.50 |
| Connell. prem. fdry. | 5.75- 6.25 |
| New River fdry. | 6.50- 6.75 |
| Wise county fdry. | 5.50- 5.75 |
| Wise county fur. | 4.50- 4.75 |

**By-Product Foundry**

| | |
|---|---|
| Newark, N. J., del. | 10.88-11.35 |
| Chi., ov., outside del. | 10.25 |
| Chicago, del | 11.00 |
| Milwaukee, ovens | 11.00 |
| New England, del. | 12.50 |
| St. Louis, del. | 11.00-11.50 |
| Birmingham, ovens | 7.50 |
| Indianapolis, del. | 10.50 |
| Cincinnati, del. | 10.50 |
| Cleveland, del. | 11.05 |
| Buffalo, del. | 10.50 |
| Detroit, del. | 11.10 |
| Philadelphia, del. | 10.65 |

## Coke By-Products

Spot, gal. Producers' Plants

| | |
|---|---|
| Pure and 90% benzol | 16.00c |
| Toluol | 30.00c |
| Solvent naphtha | 30.00c |
| Industrial xylol | 30.00c |

Per lb. f.o.b. Frankford and St. Louis

| | |
|---|---|
| Phenol (200 lb. drums) | 16.25c |
| Do. (450 lbs.) | 15.25c |

Eastern Plants, per lb.

| | |
|---|---|
| Sulphate of ammonia | $29.50 |
| Naphthalene flakes, balls, bbls. to jobbers | 6.75c |
| Per ton, bulk, f.o.b. oven or port | |
| Sulphate of ammonia | $29.50 |

# Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

| Basing Points: | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---|---|---|---|---|
| Bethlehem, Pa. | $25.00 | $25.50 | $24.50 | $26.00 |
| Birdsboro, Pa. | 25.00 | 25.50 | 24.50 | 26.00 |
| Birmingham, Ala.‡ | 20.38 | ..... | 19.38 | 25.00 |
| Buffalo | 24.00 | 24.50 | 23.00 | 25.00 |
| Chicago | 24.00 | 24.00 | 23.50 | 24.50 |
| Cleveland | 24.00 | 24.00 | 23.50 | 24.50 |
| Detroit | 24.00 | 24.00 | 23.50 | 24.50 |
| Duluth | 24.50 | 24.50 | ..... | 25.00 |
| Erie, Pa. | 24.00 | 24.50 | 23.50 | 25.00 |
| Everett, Mass. | 25.75 | 26.25 | 25.25 | 26.75 |
| Granite City, Ill. | 24.00 | 24.00 | 23.50 | 24.50 |
| Hamilton, O. | 24.00 | 24.00 | 23.50 | ..... |
| Neville Island, Pa. | 24.00 | 24.00 | 23.50 | 24.50 |
| Provo, Utah | 22.00 | ..... | ..... | ..... |
| Sharpsville, Pa. | 24.00 | 24.00 | 23.50 | 24.50 |
| Sparrow's Point, Md. | 25.00 | ..... | 24.50 | ..... |
| Swedeland, Pa. | 25.00 | 25.50 | 24.50 | 26.00 |
| Toledo, O. | 24.00 | 24.00 | 23.50 | 24.50 |
| Youngstown, O. | 24.00 | 24.00 | 23.50 | 24.50 |

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

| Delivered from Basing Points: | | | | |
|---|---|---|---|---|
| Akron, O., from Cleveland | 25.39 | 25.39 | 24.89 | 25.89 |
| Baltimore from Birmingham | 25.78 | ..... | 24.66 | ..... |
| Boston from Birmingham | 25.87 | ..... | ..... | ..... |
| Boston from Everett, Mass. | 26.25 | 26.75 | 25.75 | 27.25 |
| Boston from Buffalo | 26.25 | 26.75 | 25.75 | 27.25 |
| Brooklyn, N. Y., from Bethlehem | 27.50 | 28.00 | ..... | ..... |
| Canton, O., from Cleveland | 25.39 | 25.39 | 24.89 | 25.89 |
| Chicago from Birmingham | †24.22 | ..... | ..... | ..... |
| Cincinnati from Hamilton, O. | 24.44 | 25.11 | 24.78 | ..... |
| Cincinnati from Birmingham | 24.06 | ..... | 23.06 | ..... |
| Cleveland from Birmingham | 24.32 | ..... | 23.82 | ..... |
| Mansfield, O., from Toledo, O. | 25.94 | 25.94 | 25.44 | 25.44 |
| Milwaukee from Chicago | 25.10 | 25.10 | 24.60 | 25.10 |
| Muskegon, Mich., from Chicago, Toledo or Detroit | 27.19 | 27.19 | 26.69 | 27.69 |
| Newark, N. J., from Birmingham | 26.15 | ..... | ..... | ..... |
| Newark, N. J., from Bethlehem | 26.53 | 27.03 | ..... | ..... |
| Philadelphia from Birmingham | 25.46 | ..... | 24.96 | ..... |
| Philadelphia from Swedeland, Pa. | 25.84 | 26.34 | 25.34 | ..... |
| Pittsburgh district from Neville Island | Neville base, plus 69c, 84c, and $1.24 freight. | | | |
| Saginaw, Mich., from Detroit | 26.45 | 26.45 | 25.95 | 25.95 |

| | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---|---|---|---|---|
| St. Louis, northern | 24.55 | 24.55 | 24.05 | ..... |
| St. Louis from Birmingham | †24.12 | ..... | 23.82 | ..... |
| St. Paul from Duluth | 26.08 | 26.08 | ..... | 26.58 |

†Over 0.70 phos.

**Low Phos.**

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

| Gray Forge | | Charcoal | |
|---|---|---|---|
| Valley furnace | $23.50 | Lake Superior fur. | $27.00 |
| Pitts. dist. fur. | 23.50 | do., del. Chicago | 30.34 |
| | | Lyles, Tenn. | 26.50 |

**Silvery†**

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

**Bessemer Ferrosilicon†**

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

**Manganese differentials in silvery iron and ferrosilicon, 2 to 3%,** $1 per ton add. Each unit over 3%, add $1 per ton.

# Refractories

Per 1000 f.o.b. Works, Net Prices

**Fire Clay Brick**

*Super Quality*

| | |
|---|---|
| Pa., Mo., Ky. | $60.80 |

*First Quality*

| | |
|---|---|
| Pa., Ill., Md., Mo., Ky. | 47.50 |
| Alabama, Georgia | 47.50 |
| New Jersey | 52.50 |

*Second Quality*

| | |
|---|---|
| Pa., Ill., Ky., Md., Mo. | 42.75 |
| Georgia, Alabama | 38.00 |
| New Jersey | 49.00 |

*Ohio*

| | |
|---|---|
| First quality | 39.90 |
| Intermediate | 36.10 |
| Second quality | 31.35 |

**Malleable Bung Brick**

| | |
|---|---|
| All bases | $56.05 |

**Silica Brick**

| | |
|---|---|
| Pennsylvania | $47.50 |
| Joliet, E. Chicago | 56.05 |
| Birmingham, Ala. | 47.50 |

**Ladle Brick**

(Pa., O., W. Va., Mo.)

| | |
|---|---|
| Dry press | $28.00 |
| Wire cut | $26.00 |

**Magnesite**

| | |
|---|---|
| Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) | $45.00 |
| Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) | 40.00 |

**Base Brick**

*Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.*

| | |
|---|---|
| Chrome brick | $47.00 |
| Chem. bonded chrome | 47.00 |
| Magnesite brick | 67.00 |
| Chem. bonded magnesite | 57.00 |
| Do. f.o.b. Chewellah, Wash., net ton, bulk | 22.00 |
| net ton, bags | 26.00 |

# Fluorspar, 85-5

| | |
|---|---|
| Washed gravel, duty paid, tide, net ton | $23.50-24.00 |
| Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20, barge | $22.00 |
| No. 2 lump | 22.00-23.00 |

# Ferroalloy Prices

**Ferromanganese,** 78-82%, tidewater, duty pd. $102.50; Do., del. Pittsburgh 107.77

**Spiegeleisen,** 19-21% dom. Palmerton, Pa., spot 33.00; Do., New Orleans 33.00; Do., 26-28%, Palmerton 39.00

**Ferrosilicon,** 50% freight allowed, c.l. 69.50; Do., ton lot 80.50; Do., 75 per cent 126.00. Spot, $5 a ton higher.

**Silicoman.,** 2½ carbon 106.50, 2% carbon 111.50 1%, 121.50. Contract ton price $11 higher; spot $5 over contract.

**Ferrotungsten,** stand., lb. con. del. cars 1.85

**Ferrovanadium,** 35 to 40%, lb., cont. 2.70-2.80

**Ferrotitanium,** c. l., prod-plant, frt. all., net ton 142.50; Contract, ton lots 145.00; Spot, ton lots 150.00

**Ferrophosphorus,** per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

**Ferrochrome,** 66-70 chromium, 4-6 carbon, cts. lb. del. carlots 10.50; Do., ton lots 11.25c; Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c; Do., ton lots 17.25c; Do., less-ton lots 17.50c

| | Carloads | Ton lots | Less ton |
|---|---|---|---|
| 2% carb. | 16.50c | 17.25c | 17.50c |
| 1% carb. | 17.50c | 18.25c | 18.50c |
| 0.10% carb. | 18.50c | 19.25c | 19.50c |
| 0.20% carb. | 19.50c | 20.25c | 20.50c |

Spot ¼c higher

**Ferromolybdenum,** 55-65% molyb. cont., f.o.b. mill, lb. 0.95

**Calcium molybdate,** lb. molyb. cont., f.o.b. mill 0.80

**Ferrotitanium,** 40%, lb. con. ti., ton lots $1.23; Do, less-ton lots 1.25; 20-25% carbon, 0.10 max., ton lots, lb. 1.35; Do, less-ton lots 1.40. Spot 5c higher

**Ferrocolumbium,** 50-55%, contract, lb. con. col., f.o.b. Niagara Falls $2.25; Do, less-ton lots 2.30. Spot is 10c higher

**Technical molybdenum trioxide,** 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

**Ferro-carbon-titanium,** 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50; Do, spot 145.00; Do, contract, ton lots 145.00; Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50; Do, spot 160.00; Do, contract, ton lots 160.00; Do, spot, ton lots 165.00

**Alsifer,** contract carlots, f.o.b. Niagara Falls, lb. 7.50c; Do, ton lots 8.00c; Do, less-ton lots 8.50c. Spot ½c lb. higher

**Chromium Briquets,** contract carloads, f.o.b. Niagara Falls, lb. 7.25c; Do, spot carlots, bulk 7.50c; Do, ton lots 8.00c; Do, less-ton lots 8.50c

**Tungsten Metal Powder,** according to grade, spot shipment, 200-lb. drum lots, lb. $2.80; Do, smaller lots 3.00-3.10

**Vanadium Pentoxide,** contract, lb. contained $1.10; Do, spot 1.15

**Chromium Metal,** 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c; Do, spot 85.00c; 88% chrome, contract 79.00c; Do, spot 84.00c

**Silicon Metal,** 1% iron, contract, lb. 14.50c; Do, 2% 13.00c. Spot ¼c higher

**Silicon Briquets,** contract, carloads, f.o.b. Niagara Falls, ton $74.00; Do, spot 79.00; Less-ton lots, lb. 4.25c

**Manganese Briquets,** contract carloads, f.o.b. Niagara Falls, lb. 5.00c; Ton lots 5.50c; Less-ton lots 5.75c. Spot ¼c higher

**Zirconium Alloy,** 12-15%, carloads, gross ton $97.50; Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c; Do, ton lots 15.00c; Do, less-ton lots 16.00c. Spot ¼c higher

**Molybdenum Powder,** 99%, f.o.b. York, Pa., 200-lb. kegs, lb. $2.60; Do, 100-200 lb. lots 2.75; Do, under 100-lb. lots 3.00

# WAREHOUSE STEEL PRICES

*Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials*

| | Soft Bars | Bands | Hoops | Plates ¼-In. & Over | Structural Shapes | Floor Plates | Sheets Hot Rolled No. 10 | Sheets Hot Roll Ann. No. 24 | Sheets Galv. No. 24 |
|---|---|---|---|---|---|---|---|---|---|
| Boston | 4.26 | 4.46 | 5.46 | 4.11 | 4.10 | 5.76 | 4.21 | 4.96 | 5.00 |
| New York (Metropolitan) | 4.16 | 4.36 | 4.36 | 4.02 | 3.99 | 5.62 | 4.11 | 4.75 | 5.00 |
| Philadelphia | 4.03 | 4.13 | 4.63 | 3.92 | 3.92 | 5.25 | 4.03 | 4.65 | 4.90 |
| Baltimore | 4.00 | 4.20 | 4.45 | 3.90 | 3.90 | 5.50 | 3.95 | 4.50 | 4.70 |
| Norfolk, Va. | 4.20 | 4.40 | 4.65 | 4.10 | 4.10 | 5.70 | 4.15 | 4.75 | 5.40 |
| Buffalo | 3.90 | 4.25 | 4.25 | 3.95 | 3.80 | 5.55 | 4.00 | 4.83 | 5.38 |
| Pittsburgh | 3.80 | 4.00 | 4.00 | 3.70 | 3.70 | 5.30 | 3.75 | 4.50 | 5.15 |
| Cleveland | 3.75 | 4.19 | 4.19 | 3.89 | 3.89 | 5.49 | 3.94 | 4.69 | 5.34 |
| Detroit | 3.935 | 4.185 | 4.185 | 3.95 | 3.95 | 5.55 | 3.935 | 4.685 | 5.40 |
| Cincinnati | 4.09 | 4.29 | 4.29 | 3.99 | 3.99 | 5.59 | 4.04 | 4.79 | 5.44 |
| Chicago | 3.85 | 4.10 | 4.10 | 3.75 | 3.75 | 5.35 | 3.85 | 4.60 | 5.25 |
| Minneapolis | 4.10 | 4.35 | 4.35 | 4.00 | 4.00 | 5.60 | 4.10 | 4.75 | 5.00 |
| Milwaukee | 3.96 | 4.21 | 4.21 | 3.86 | 3.86 | 5.46 | 3.96 | 4.71 | 5.36 |
| St. Louis | 4.12 | 4.37 | 4.37 | 4.02 | 4.02 | 5.62 | 4.12 | 4.87 | 5.52 |
| Kansas City | 4.40 | 4.65 | 4.65 | 4.30 | 4.30 | 5.90 | 4.10 | 4.85 | 5.50 |
| Memphis | 4.35 | 4.55 | 4.55 | 4.25 | 4.25 | 5.91 | 4.30 | 5.05 | 5.70 |
| Chattanooga | 4.25 | 4.45 | 4.45 | 4.15 | 4.15 | 5.98 | 4.20 | 4.10 | 4.70 |
| Tulsa, Okla. | 4.89 | 5.14 | 5.14 | 4.79 | 4.79 | 6.39 | 4.89 | 5.64 | 6.29 |
| Birmingham, Ala. | 3.85 | 4.05 | 4.05 | 3.75 | 3.75 | 6.03 | 3.80 | 4.55 | 5.20 |
| New Orleans | 4.10 | 4.65 | 4.65 | 4.00 | 4.00 | 5.95 | 4.25 | 4.75 | 5.15 |
| Houston, Tex. | 3.75 | 6.15 | 6.55 | 4.25 | 4.25 | 6.15 | 4.50 | 5.25 | 5.65 |
| Seattle | 4.45 | 4.95 | 6.30 | 4.25 | 4.25 | 6.00 | 4.50 | 5.35 | 5.90 |
| Portland, Oreg. | 4.45 | 4.95 | 6.30 | 4.25 | 4.25 | 6.00 | 4.50 | 5.15 | 5.90 |
| Los Angeles | 4.30 | 4.80 | 6.55 | 4.30 | 4.30 | 6.20 | 4.50 | 5.00 | 5.25 |
| San Francisco | 4.20 | 4.80 | 6.50 | 4.05 | 4.05 | 5.55 | 4.30 | 5.15 | 5.55 |

| | Cold Rolled Strip | Cold Finished Bars | SAE Hot-rolled Bars (Unannealed) 1035-1050 | 2300 Series | 3100 Series | 4100 Series | 6100 Series | SAE Cold Drawn Bars 2300 | SAE Cold Drawn Bars 3100 |
|---|---|---|---|---|---|---|---|---|---|
| Boston | 3.86 | 4.71 | 4.56 | 8.00 | 6.55 | 6.30 | 8.40 | 9.02 | 7.57 |
| New York | 3.96 | 4.61 | 4.36 | 7.84 | 6.39 | 6.14 | 9.54 | 9.04 | 7.59 |
| Philadelphia | 3.91 | 4.56 | 4.28 | 7.81 | 6.36 | 6.11 | 9.01 | .... | .... |
| Baltimore | .... | 4.55 | 4.15 | .... | .... | .... | .... | .... | .... |
| Norfolk, Va. | .... | 4.60 | .... | .... | .... | .... | .... | .... | .... |
| Buffalo | 3.82 | 4.35 | 4.10 | 7.60 | 6.15 | 5.90 | 8.00 | 8.60 | 8.15 |
| Pittsburgh | .... | 4.15 | 3.95 | 7.70 | 6.25 | 8.50 | 9.10 | 8.70 | 7.25 |
| Cleveland | 3.60 | 4.30 | 3.95 | 7.78 | 6.33 | 6.33 | 8.18 | 8.60 | 7.15 |
| Detroit | 3.78 | 4.30 | 4.085 | 7.89 | 6.44 | 6.19 | 7.74 | 8.88 | 7.43 |
| Cincinnati | .... | 4.54 | 4.10 | 7.94 | 6.49 | 6.24 | 9.34 | 8.95 | 7.50 |
| Chicago | 3.91 | 4.30 | 4.05 | 7.60 | 6.15 | 5.90 | 8.00 | 8.60 | 7.15 |
| Minneapolis | .... | 4.83 | 4.25 | 7.95 | 6.50 | 9.03 | 9.63 | 9.23 | 7.78 |
| Milwaukee | .... | 4.41 | 4.16 | 7.81 | 6.36 | 6.11 | 8.21 | 8.81 | 7.36 |
| St. Louis | 4.01 | 4.57 | 4.32 | 7.97 | 6.52 | 6.27 | 8.37 | 8.97 | 7.52 |
| Kansas City | 4.46 | 4.85 | .... | .... | .... | .... | .... | .... | .... |
| Memphis | .... | 4.86 | .... | .... | .... | .... | .... | .... | .... |
| Chattanooga | .... | 4.90 | .... | .... | .... | .... | .... | .... | .... |
| Tulsa, Okla. | .... | 5.34 | .... | .... | .... | .... | .... | .... | .... |
| New Orleans | 5.00 | 5.10 | .... | .... | .... | .... | .... | .... | .... |
| Seattle | .... | 5.85 | 6.05 | .... | 8.00 | 8.00 | 8.65 | .... | .... |
| Portland, Oreg. | .... | 5.85 | 5.85 | 9.00 | 8.00 | 7.85 | 8.70 | .... | .... |
| Los Angeles | 5.96 | 6.85 | 4.65 | 9.40 | 8.55 | 8.40 | 9.05 | 10.40 | 9.55 |
| San Francisco | 9.30 | 6.80 | 5.20 | 9.65 | 8.80 | 8.65 | 9.30 | 10.65 | 9.80 |

# CURRENT IRON AND STEEL PRICES OF EUROPE

**Dollars at Rates of Exchange, May 12**

## Export Prices f. o. b. Port of Dispatch—

*By Cable or Radio*

| | British gross tons U. K. ports £ s d | Continental Channel or North Sea ports, gross tons: Quoted in dollars at current value | Continental Channel or North Sea ports, gross tons: **Quoted in gold pounds sterling £ s d |
|---|---|---|---|
| Foundry, 2.50-3.00 Si. | $27.34 5 10 0 | $16.40 | 2 1 0 |
| Basic bessemer | .... .... | 17.89 | 2 4 6 |
| Hematite, Phos. .03-.05 | 32.31 6 10 0* | ..... | ..... |
| Billets | $39.14 7 17 6 | $43.22 | 5 7 6 |
| Wire rods, No. 5 gage | 56.04 11 5 6 | 41.01 | 5 2 6 |
| Standard rails | $50.32 10 2 6 | $46.23 | 5 15 0 |
| Merchant bars | 2.44c 11 0 0 | 1.90c | 5 5 0 |
| Structural shapes | 2.36c 10 12 6 | 1.77c | 4 17 6 |
| Plates, †¾ in. or 5 mm. | 2.57c 11 11 3 | 2.23c | 6 2 6 |
| Sheets, black, 24 gage or 0.5 mm. | 3.11c 14 0 0 | 2.82c | 7 15 0° |
| Sheets, gal., 24 ga., corr. | 3.72c 16 15 0 | 3.45c | 9 10 0 |
| Bands and strips | 2.94c 13 5 0 | 1.99c | 5 10 0 |
| Plain wire, base | 4.33c 19 10 0 | 2.23c to 2.64c | 6 2 6 to 7 5 0 |
| Galvanized wire, base | 5.17c 23 5 0 | 2.85c to 2.95c | 7 17 6 to 8 2 6 |
| Wire nails, base | 4.11c 18 10 0 | 2.54c to 2.72c | 7 0 0 to 7 10 0 |
| Tin plate, box 108 lbs. | $5.04 1 0 3 | ..... | ..... |

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid

## Domestic Prices at Works or Furnace—

*Last Reported*

| | £ s d | French Francs | | Belgian Francs | | Reich Marks |
|---|---|---|---|---|---|---|
| Fdy. pig iron, Si. 2.5 | $27.09 5 9 0(a) | $15.78 | 563.50 | $19.43 | 575 | $25.33 63 |
| Basic bess. pig iron | 24.85 5 0 0(a) | ..... | .... | ..... | ... | 27.94 (b) 69.50 |
| Furnace coke | 8.08 1 12 6 | 5.74 | 205 | 7.27 | 215 | 7.64 19 |
| Billets | 39.14 7 17 6 | 23.52 | 840 | 29.07 | 860 | 38.79 96.50 |
| Standard rails | 2.25c 10 2 6 | 1.50c | 1,150 | 2.06c | 1,375 | 2.38c 132 |
| Merchant bars | 2.71c 12 4 0†† | 1.40c | 1,080 | 1.65c | 1,100 | 1.98c 110 |
| Structural shapes | 2.45c 11 0 6†† | 1.37c | 1,055 | 1.65c | 1,100 | 1.93c 107 |
| Plates, †¾-in. or 5 mm. | 2.60c 11 14 3†† | 1.76c | 1,350 | 2.06c | 1,375 | 2.29c 127 |
| Sheets, black | 3.50c 15 15 0§ | 2.03c | 1,565‡ | 2.36c | 1,575‡ | 2.59c 144‡ |
| Sheets, galv., corr., 24 ga. or 0.5 mm | 4.11c 18 10 0 | 2.93c | 2,250 | 4.43c | 2,950 | 6.66c 370 |
| Plain wire | 4.33c 19 10 0 | 2.16c | 1,660 | 2.48c | 1,650 | 3.11c 173 |
| Bands and strips | 2.87c 12 19 0†† | 1.57c | 1,210 | 1.95c | 1,300 | 2.29c 127 |

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 64.3 per cent over paper sterling.

# IRON AND STEEL SCRAP PRICES

*Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices*

**HEAVY MELTING STEEL**

| | |
|---|---|
| Birmingham, No. 1 | 10.00 |
| Bos. dock No. 1 exp. | 10.00-10.50 |
| N. Eng. del. No. 1 | 11.50 |
| Buffalo, No. 1 | 10.50-11.00 |
| Chicago, No. 1 | 11.00-11.50 |
| Chicago, auto, no alloy | 9.00- 9.50 |
| Chicago, No. 2 auto | 8.50- 9.00 |
| Cincinnati | 8.00- 8.50 |
| Cleveland, No. 1 | 10.50-11.00 |
| Cleveland, No. 2 | 9.50-10.00 |
| Detroit, No. 1 | 6.50- 7.00 |
| Eastern Pa., No. 1 | 12.00-12.50 |
| Eastern Pa., No. 2 | 10.00-10.50 |
| Federal, Ill. | 9.50-10.00 |
| Granite City, R. R. | 10.25-10.75 |
| Granite City, No. 2 | 9.25- 9.75 |
| Los Angeles, No. 1 | 11.50-12.00 |
| Los Angeles, No. 2 | 10.50-11.00 |
| New York, No. 1 | †9.50 |
| N. Y. dock No. 1 exp. | 9.50 |
| Pitts., No. 1 (R. R.) | 13.50-14.00 |
| Pitts., No. 1 (dlr.) | 11.50-12.00 |
| Pittsburgh, No 2 | 10.50-11.00 |
| St. Louis, R. R. | 10.25-10.75 |
| St. Louis, No. 2 | 9.25- 9.75 |
| San Francisco, No. 1 | 12.00 |
| Seattle, No. 1 | 10.00-12.00 |
| Toronto, dirs. No. 1 | 9.00 |
| Valleys, No. 1 | 11.00-11.50 |

**COMPRESSED SHEETS**

| | |
|---|---|
| Buffalo | 8.50- 9.00 |
| Chicago, factory | 10.00-10.50 |
| Chicago, dealer | 9.50-10.00 |
| Cleveland | 10.00-10.50 |
| Detroit | 7.50- 8.00 |
| E. Pa., new mat. | 12.00-12.50 |
| E. Pa., old mat. | 8.00- 8.50 |
| Los Angeles | 12.50-13.00 |
| Pittsburgh | 11.50-12.00 |
| St. Louis | 6.00- 6.50 |
| Valleys | 10.50-11.00 |

**BUNDLED SHEETS**

| | |
|---|---|
| Buffalo, new | 8.50- 9.00 |
| Buffalo, old | 7.50- 8.00 |
| Cincinnati, del. | 7.50- 8.00 |
| Cleveland | 7.50- 8.00 |
| Los Angeles | 11.00-11.50 |
| Pittsburgh | 10.50-11.00 |
| St. Louis | 5.25- 5.75 |
| Toronto, dealers | 6.00 |

**SHEET CLIPPINGS, LOOSE**

| | |
|---|---|
| Chicago | 6.00- 6.50 |
| Cincinnati | 3.50- 4.00 |
| Detroit | 4.75- 5.25 |
| †Los Angeles | 3.75- 4.00 |
| St. Louis | 4.00- 4.50 |

**STEEL RAILS, SHORT**

| | |
|---|---|
| Birmingham | 15.00 |
| Buffalo | 15.50-16.00 |
| Chicago (3 ft.) | 14.00-14.50 |
| Chicago, (2 ft.) | 14.50-15.00 |
| Cincinnati, del. | 15.25-15.75 |
| Detroit | 13.50-14.00 |
| Los Angeles | 15.00-17.50 |
| Pitts., 3 ft. and less | 16.00-16.50 |
| St. Louis, 2 ft. & less | 13.00-13.50 |

**STEEL RAILS, SCRAP**

| | |
|---|---|
| Boston district | †10.00 |
| Buffalo | 12.50-13.00 |
| Chicago | 11.00-11.50 |
| Cleveland | 14.00-14.50 |
| Pittsburgh | 15.00-15.50 |
| St. Louis | 11.00-11.50 |
| Seattle | 16.00 |

**STOVE PLATE**

| | |
|---|---|
| Birmingham | 8.00- 8.50 |
| Boston district | †7.00 |
| Buffalo | 10.50-11.00 |
| Chicago, net | 7.50- 8.00 |
| Cincinnati, dealers | 5.00- 5.50 |
| Detroit, net | 7.50- 8.00 |
| Eastern Pa. | 10.50-11.00 |
| New York, fdry. | †6.50- 7.00 |
| St. Louis | 6.75- 7.25 |
| Toronto, dealers, net | 8.00 |

**SPRINGS**

| | |
|---|---|
| Buffalo | 14.00-14.50 |
| Chicago, coil | 14.50-15.00 |
| Chicago, leaf | 14.00-14.50 |
| Eastern Pa. | 15.50-16.00 |
| Pittsburgh | 16.00-16.80 |
| St. Louis | 12.75-13.25 |

**ANGLE BARS—STEEL**

| | |
|---|---|
| Chicago | 13.00-13.50 |
| St. Louis | 11.50-12.00 |

**RAILROAD SPECIALTIES**

| | |
|---|---|
| Chicago | 13.50-14.00 |

**LOW PHOSPHORUS**

| | |
|---|---|
| Buffalo, crops | 14.50-15.00 |
| Cleveland, crops | 17.50-18.50 |
| Eastern Pa., crops | 16.00-16.50 |
| Pittsburgh, crops | 16.50-17.00 |

**FROGS, SWITCHES**

| | |
|---|---|
| Chicago | 11.00-11.50 |
| St. Louis, cut | 11.25-11.75 |

**SHOVELING STEEL**

| | |
|---|---|
| Federal, Ill. | 9.50-10.00 |
| Granite City, Ill. | 9.25- 9.75 |
| Los Angeles | 15.00-16.50 |
| Toronto, dealers | 7.00 |

**RAILROAD WROUGHT**

| | |
|---|---|
| Birmingham | 11.00-11.50 |
| Boston district | †9.00- 9.50 |
| Chicago, No. 1 net | 8.50- 9.00 |
| Cincinnati, No. 2 | 8.00- 8.50 |
| Eastern Pa., No. 1 | 13.50-14.00 |
| St. Louis, No. 1 | 8.00- 8.50 |
| St. Louis, No. 2 | 9.75-10.25 |
| Toronto, No. 1 dlr. | 15.00 |

**SPECIFICATION PIPE**

| | |
|---|---|
| Eastern Pa. | 12.00-12.50 |
| New York | †7.50- 8.00 |

**BUSHELING**

| | |
|---|---|
| Buffalo, No. 1 | 8.50- 9.00 |
| Chicago, No. 1 | 9.50-10.00 |
| Cincin., No. 1, deal. | 6.25- 6.75 |
| Cincinnati, No. 2 | 2.00- 2.50 |
| Cleveland, No. 2 | 5.50- 6.00 |
| Detroit, No. 1, new | 6.25- 6.75 |
| Valleys, new, No. 1 | 10.00-10.50 |
| Toronto, dealers | 6.00 |

**MACHINE TURNINGS (Long)**

| | |
|---|---|
| Birmingham | 6.00- 7.00 |
| Buffalo | 4.50- 5.00 |
| Chicago | 4.50- 5.00 |
| Cincinnati, dealers | 2.50- 3.00 |
| Cleveland | 5.50- 6.00 |
| Detroit | 3.25- 3.75 |
| Eastern Pa. | 6.50 |
| Los Angeles | 4.00- 4.25 |
| New York | †2.50- 3.00 |
| Pittsburgh | 6.50- 7.00 |
| St. Louis | 3.00- 3.50 |
| Toronto, dealers | 6.00 |
| Valleys | 8.50- 9.00 |

**BORINGS AND TURNINGS**

*For Blast Furnace Use*

| | |
|---|---|
| Boston district | 1.25 |
| Buffalo | 4.50- 5.00 |
| Cincinnati, dealers | 2.00- 2.50 |
| Cleveland | 5.50- 6.00 |
| Eastern Pa. | 6.00- 6.50 |
| Detroit | 3.75- 4.25 |
| New York | †2.50- 3.00 |
| Pittsburgh | 6.00- 6.50 |
| Toronto, dealers | 6.50 |

**CAST IRON BORINGS**

| | |
|---|---|
| Birmingham | 6.00- 7.00 |
| Boston dist. chem. | †6.00 |
| Bos. dist. for mills | †6.00 |
| Buffalo | 4.00- 4.50 |
| Chicago | 4.75- 5.25 |
| Cincinnati, dealers | 2.00- 2.50 |
| Cleveland | 5.50- 6.00 |
| Detroit | 3.75- 4.25 |
| E. Pa., chemical | 10.00-11.00 |
| New York | †3.00- 3.50 |
| St. Louis | 3.00- 3.50 |
| Toronto, dealers | 6.50 |

**PIPE AND FLUES**

| | |
|---|---|
| Cincinnati, dealers | 5.00- 5.50 |
| Chicago, net | 7.50- 8.00 |

**RAILROAD GRATE BARS**

| | |
|---|---|
| Buffalo | 8.00- 8.50 |
| Chicago, net | 7.50- 8.00 |
| Cincinnati | 5.50- 6.00 |
| Eastern Pa. | 10.00-10.50 |
| New York | †7.50 |
| St. Louis | 7.00- 7.50 |

**FORGE FLASHINGS**

| | |
|---|---|
| Boston district | †4.50 |
| Buffalo | 8.50- 9.00 |
| Cleveland | 10.00-10.50 |
| Detroit | 5.75- 6.25 |
| Los Angeles | 9.00 |
| Pittsburgh | 10.50-11.00 |

**FORGE SCRAP**

| | |
|---|---|
| Boston district | †4.50 |
| Chicago, heavy | 14.50-15.00 |

**ARCH BARS, TRANSOMS**

| | |
|---|---|
| St. Louis | 12.00-12.50 |

**AXLE TURNINGS**

| | |
|---|---|
| Boston district | †7.50 |
| Buffalo | 9.00- 9.50 |
| Chicago, elec. fur. | 10.00-10.50 |
| Eastern Pa. | 9.50 10.00 |
| St. Louis | 8.00- 8.50 |
| Toronto | 7.00 |

**STEEL CAR AXLES**

| | |
|---|---|
| Birmingham | 16.00-17.00 |
| Buffalo | 15.50-16.00 |
| Boston district | †14.00 |
| Chicago, net | 16.00-16.50 |
| Eastern Pa. | 21.50-22.50 |
| St. Louis | 17.00-17.50 |

**SHAFTING**

| | |
|---|---|
| Boston district | †13.00-13.50 |
| New York | †14.00-14.50 |
| Eastern Pa. | 18.00-18.50 |
| St. Louis | 13.00-13.50 |

**CAR WHEELS**

| | |
|---|---|
| Birmingham | 14.00-15.00 |
| Boston dist., iron | †10.00 |
| Buffalo, steel | 14.00-14.50 |
| Chicago, iron | 13.00-13.50 |
| Chicago, rolled steel | 13.50-14.00 |
| Cincinnati, iron | 12.00-12.50 |
| Eastern Pa., iron | 14.50-15.00 |
| Eastern Pa., steel | 15.50-16.00 |
| Pittsburgh, iron | 14.00-14.50 |
| Pittsburgh, steel | 16.00-16.50 |
| St. Louis, iron | 11.25-11.75 |
| St. Louis, steel | 12.75-13.25 |

**NO. 1 CAST SCRAP**

| | |
|---|---|
| Birmingham | 14.00-14.50 |
| Boston, No. 1 mach. | †10.00 |
| N. Eng. del. No. 2 | 11.50 |
| N. Eng. del. textile | 14.00-14.50 |
| Buffalo, cupola | 12.50-13.00 |
| Buffalo, mach. | 13.00-13.50 |
| Chicago, agri. net | 9.50-10.00 |
| Chicago, auto | 10.50-11.00 |
| Chicago, railr'd net | 10.00-10.50 |
| Chicago, mach. net | 10.50-11.00 |
| Cincin., mach. cup. | 10.00-10.50 |
| Cleveland, mach. | 14.50-15.00 |
| Eastern Pa., cupola | 14.50-15.00 |
| E. Pa., mixed yard | 12.00 |
| Los Angeles, net | 13.50-14.00 |
| Pittsburgh, cupola | 14.00-14.50 |
| San Francisco, del. | 13.50-14.00 |
| Seattle | 10.00-12.00 |
| St. Louis, No. 1 | 10.50-11.00 |
| St. L., No. 1, mach. | 12.25-12.75 |
| Toronto, No. 1, mach., net | 11.50 |

**HEAVY CAST**

| | |
|---|---|
| Boston dist. break. | †7.25- 7.75 |
| New England, del. | 10.50-11.00 |
| Buffalo, break. | 10.00-10.50 |
| Cleveland, break. | 13.00-14.00 |
| Detroit, break. | 10.00-10.50 |
| Detroit, auto net | 11.00-11.50 |
| Eastern Pa. | 13.00-13.50 |
| Los Ang., auto, net | 13.00-13.50 |
| New York, break. | †8.00- 8.50 |
| Pittsburgh, break. | 11.50-12.00 |

**MALLEABLE**

| | |
|---|---|
| Birmingham, R. R. | 12.50-13.50 |
| New England, del. | 16.00 |
| Buffalo | 12.00-12.50 |
| Chicago, R. R. | 12.50-13.00 |
| Cincin., agri. del. | 9.25- 9.75 |
| Cleveland, rail | 14.50-15.00 |
| Detroit, auto | 10.00-10.50 |
| Eastern Pa., R. R. | 14.00-14.50 |
| Los Angeles | 17.50-18.00 |
| Pittsburgh, rail | 14.00-14.50 |
| St. Louis, R. R. | 10.00-10.50 |

**RAILS FOR ROLLING**

*5 feet and over*

| | |
|---|---|
| Birmingham | 16.00-17.00 |
| Boston | †11.00 |
| Chicago | 14.50-15.00 |
| Eastern Pa. | 16.00-16.50 |
| New York | †14.00-14.50 |
| St. Louis | 13.25-13.75 |

**LOCOMOTIVE TIRES**

| | |
|---|---|
| Chicago (cut) | 14.00-14.50 |
| St. Louis, No. 1 | 12.00-12.50 |

**LOW PHOS. PUNCHINGS**

| | |
|---|---|
| Buffalo | 14.50-15.00 |
| Chicago | 13.50-14.00 |
| Eastern Pa. | 16.00-16.50 |
| Pitts. (light & hvy.) | 16.00-16.50 |
| Seattle | 15.00 |

## Iron Ore

**Lake Superior Ore**

*Gross ton, 51½ % Lower Lake Ports*

| | |
|---|---|
| Old range bessemer | $5.25 |
| Mesabi nonbess. | 4.95 |
| High phosphorus | 4.85 |
| Mesabi bessemer | 5.10 |
| Old range nonbess. | 5.10 |

**Eastern Local Ore**

*Cents, unit, del. E. Pa.*

| | |
|---|---|
| Foundry and basic 56.63% con. | 9.00-10.00 |
| Cop.-free low phos. 58-60% | nominal |

**Foreign Ore**

*Cents per unit, f.a.s. Atlantic*

| | |
|---|---|
| Foreign manganiferous ore, 45.55% iron, 6-10% man. nom. | 12.00-13.00 |
| No. Afr. low phos. | nominal |
| Swedish low phos. | 17.00-18.00 |
| Spanish No. Africa basic, 50 to 60% nom. | 12.00 |
| Tungsten, sh. ton. unit, duty pd. nom. | $15.75 |
| N. F., fdy., 55% | 7.00 |
| Chrome ore, 48% gross ton, c.i.f. | $25.50-26.50 |
| Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill | 0.75 |

## Manganese Ore

Prices not including duty, cents per unit cargo lots.

| | |
|---|---|
| Caucasian, 50-52% non. | 45.00 |
| So. African, 50-52% nom. | 45.00 |
| Indian, 50-52% | Nominal |

# Sheets

Sheet Prices, Page 86

**Pittsburgh** — Announcement of third-quarter prices on sheets is expected within the next few days and indications are base prices will remain unchanged, with the possibility that there may be some revisions of extras and deductions. Revisions will probably be minor in character, however. Production remains at the same level, with orders still spotty and for immediate consumption. Production of common sheets is estimated at between 30 and 35 per cent, with galvanized sheets at 39 per cent.

**Cleveland**—Demand for hot and cold-rolled sheets has failed to register much change this month. In a few instances producers note a slight falling off in shipments the past week, due to irregular rolling schedules. Consumers continue to enter the market for miscellaneous tonnages, representing actual needs, and requesting immediate delivery due to low inventory position under which many are operating. Sellers expect third quarter prices to be announced soon.

**Chicago** — Sheet business is receding, with part of the curtailment attributed to the desire of consumers to withhold buying as much as possible pending announcement of third quarter prices. Consumption is lighter among average miscellaneous users and demand from farm equipment builders also is off seasonally. Warehouses still provide a major outlet for sheets. Automotive buying is lacking.

**Boston**—Industrial consumers of sheets continue to buy in small lots, operations being much curtailed. This is especially true of most stamping, forming and sheet metal shops. Miscellaneous demand is spotty and small tank fabricators have little volume on books with fair inventories of steel, based on current production. Jobbers, distributing the large volume of sheets in New England, are buying to fill gaps in stocks only.

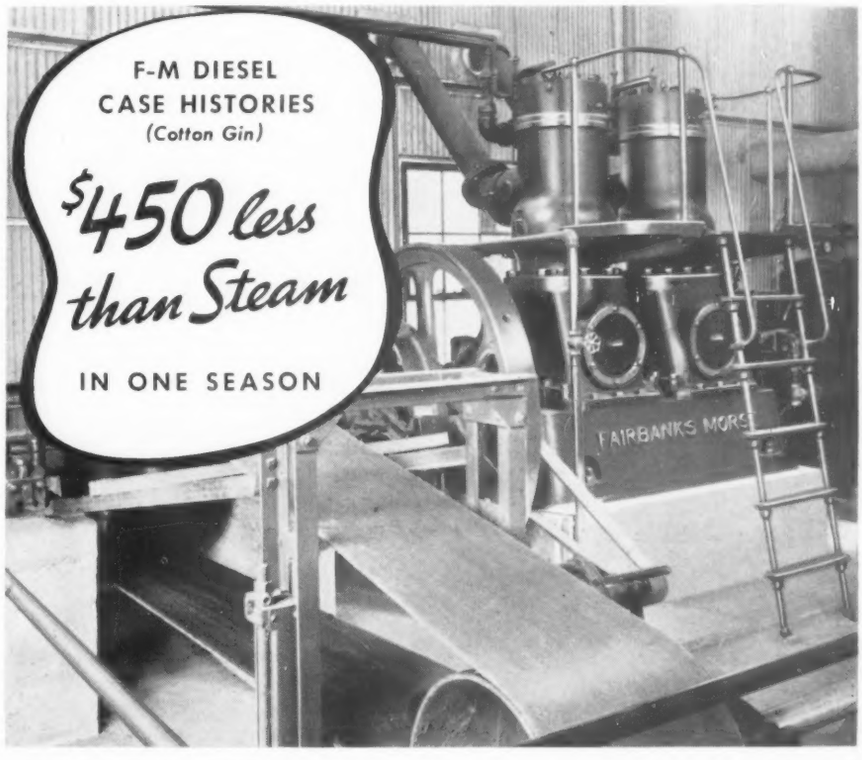
**New York** — With the opening of books for third quarter expected soon consumers of sheets are specifying even more slowly than recently. While producers have given no intimation that there will be a reduction in price for next quarter, buyers, in the absence of pressing need for sheets, are moving cautiously on the assumption that they have nothing to lose and might have something to gain.

Such clarification as to the immediate trend in prices as will come with opening of books for third quarter might have a mildly stimulating effect on tonnage, even though prices are reaffirmed.

Some consumers have let stocks reach a decidedly low point compared with anything like normal standards and might make some replenishments were they assured there would be no early decline in prices. However, the general outlook is for restricted buying for some weeks, regardless of what clarifying influence may develop as the result of opening of books for third quarter.

**Philadelphia** — Stocks are being kept down as consumers await clarification of third quarter prices. However, one automotive interest has bought 200 tons of cold-rolled and others have releases on several hundred tons of material for bodies and frames. Philco is still down on account of strike but a second radio interest is slightly more active. Miscellaneous buying is being maintained, although held close to actual needs. A revision of allowances on galvanized sheets to jobbers is reported.

**Buffalo** — Slight improvement is


● Recently the Clio Gin Co., of Alexandria, La., replaced steam power with a Fairbanks-Morse Model 32-E 2-cycle Diesel engine. During the first ginning season following installation, power cost was $450 less than steam power would have cost for the same operating period.

Call the roll of industry throughout the nation. Name any kind of industrial plant. The answer is always the same—F-M Diesel power is proving its case in cold black-and-white figures that represent money saved.

In the cotton gin, for example, it is always costly to raise steam for ginning a few bales—and hold it there all day, awaiting more. But the F-M Diesel engine can be started and shut down, and when it is shut down—power cost stops.

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F-M Diesels

# Behind the Scenes with STEEL

### Baby No. 1

■ We all worked ourselves up to a "safety pin and diaper" mood this last week as the stork worked two shifts and did his double duty. First off came word from STEEL's New York office that eastern editor Irwin "Pinkie" Such now answers to the age-old cry of "Pappy," the newly arrived voice being bouncing Barbara Ann. Cigars and other sundry offerings are being patiently awaited.

### Baby No. 2

■ The other arrival is a boy, which should make it nice. He is a character by the name of NED. Of course, NED is really about two years old but he is just getting his start in life. NED's full name is New Equipment Digest, the new member of the Penton family—a monthly tabloid which opens a lot of doors and sees a lot of people. NED knows his way around and they tell us he'll introduce you to plenty of worthwhile gents if you like that sort of thing.

### Bright Spot

■ Back-patter Fred Chambers, industrial division, National Gypsum Co. says "one of the brightest spots in your magazine is the two column box (sic) 'Behind the Scenes'." Nice man Chambers doesn't confine his complimenting to words either. Under the usual separate cover arrived some extra elegant smokes dressed up in a gold wrapper which reads: "When you smoke a Lucky Strike, think of Luckey, Ohio—that's where I live." We tried it for a while but we smoke so darned much we couldn't get Fred Chambers off our mind, so we switched to English Ovals. Now we roll in our sleep.

### Insomnia

■ Maybe George Robbins, down in Miami, Fla., has been smoking Ovals, too. He writes, "I have hardly been able to sleep well until I am able to congratulate you on your 'Pipe Smoking Editors'." G. R. wants to have some more stainless prices and data, too, and the boys are all puffing away on their weeds to see if things can't be arranged.

### Force of Habit

■ Speaking of Miami recalls the story one of our traveling editors tells about the southerner he was discussing politics with lately. When asked why he voted the Dem. ticket, he drawled: "Wahl, m' great grandfather, m' grandfather, m' pappy and all m' kinfolk have always voted the Dem. ticket and that's why I did. But," he said, "if you all up nawth don't stop doin' it, this country is sure goin' plum to the dawgs."

### Behind a Head

■ This last week we helped preview the U. S. Steel Corp. technicolor sound picture—"Steel—Man's Servant." For forty two minutes we dodged and jerked and tried to outmaneuvre a bobbing white head in front of us, all the while listening to Edwin C. Hill give the running commentary. It's a swell show and you want to see it but get there early so you won't have to sit behind Whitey Maurath—or better still get Whitey to go with you.

### Founders Meet

■ Big meetin' this week over at the auditorium. Every guy that ever saw a runner cup will be there so if you're within an overnight hike, better drop in. Come and see us, too. We'll be ducking in and out of all the better booths filling our duffle bags with free pencils, cigs., and key holders. With our quick change outfit it's a cinch to get seconds, even.

—SHRDLU



noticeable in the sheet market. The minor pickup is attributed to a miscellaneous lot of small orders. There is no indication, however, that the gain will be sustained. Mills are not holding to steady operating schedules, as production is limited to filling pending orders.

**Cincinnati** — Although sheet specifications are near previous levels, lack of normal seasonal expansion in material for automobiles, stoves and refrigerators seems to preclude early gains. Mill production has tended steadier in the last four weeks despite reductions in mill stocks.

**St. Louis**—Buying of sheets is confined to small lots, all for prompt delivery and mainly by miscellaneous users. Warehouses have moderately increased orders but tonnages are for filling out stocks and assortments, and not anticipatory of future needs. The leading producer has temporarily gone out of production on ingots, having completed stock operations, and will not resume until new business warrants.

Outlet through the building industry has failed to broaden, but outlook for late spring and summer is more promising. As compared with a year ago, demand for tin plate is reported measurably lower. This reflects chiefly reduced requirements of can manufacture and building.

**Birmingham, Ala.** — With a fairly steady flow of small orders, sheets are moving at approximate rate of manufacture. Roofing continues somewhat off from previous weeks while manufacturers' sheets are holding up comparatively well.

## Strip

**Strip Prices, Page 87**

**Pittsburgh** — Strip production is between 20 and 25 per cent of capacity. Orders are on the same basis as for several weeks, strictly hand to mouth and in small lots. Inventories generally are low and are being held down in view of the uncertain outlook.

**Cleveland**—Demand for wide and narrow hot and cold-rolled strip has fluctuated only slightly this month, generally remaining on about the level reported in April. Inventory among most consumers has been substantially reduced over the last 60 days and reflected on requests for immediate delivery and general hand-to-mouth buying. Outlook for May is that total tonnage booked will register a slight decline from April. No real improvement is expected from automotive sources until work on the 1939 models is underway.

**Chicago** — Strip buying is slower

and while consumption has declined only moderately since a month ago, there is little expectation of a reversal of this trend. Buyers are awaiting third quarter price announcements, a situation also contributing to light demand.

**Boston** — Incoming narrow strip volume is barely holding to the recent low rate, with mill operations irregular and unchanged at near 30 to 35 per cent. For weeks consumers have specified prompt shipment on all business, but now are pressing for even earlier shipment after placing fill-in orders. Some are even shopping for best deliveries. Buyers in some instances also are influenced by approaching announcement of third quarter prices. One hot-strip consumer postponed placing several hundred tons until that time. There is some spotty price weakness in cold strip, but in general mill prices are holding well.

**New York** — Demand for cold rolled strip has tapered with most sellers, buying being confined to small fill-in needs. More users are holding off until after third quarter prices are known. This is notably true of hot strip buyers. A fair part of current light volume is coming from makers of new goods or gadgets for household use.

**Philadelphia** — Narrow strip buying is being confined to small individual orders. Some specialty makers are getting a little more business, one having enough to operate one shift through May and June.

**Birmingam, Ala.** — Strip business is virtually at a standstill until a new season for cotton ties starts.

# Plates

**Plate Prices, Page 86**

**New York** — Local interest in plates is centered on the placing of requirements for the 30 arc-welded steel scows on which the city opened bids last week and for which about 9000 tons of steel will be required and for the 1200 hopper cars which are to be built by the American Car & Foundry Co., with purchasing offices here, for the Southern Railway.

Several days at least may elapse before action is likely on the scows while bids are being analyzed. Any of three of the several bidders appear to have an inside chance. These are Dravo Construction Co., Pittsburgh, which was low, but on a design of its own; JK Welding Inc., Long Island City, N. Y., second low, but also on an alternate bid, second low bidder on the city design, with JK Welding Inc., on an alternate bid, second low bidder on the city design.

A sizable tonnage of plates will be required for the Delaware water supply project on which the local board of water supply recently awarded construction contracts. Oil company buying is featured by the placing of five tanks, requiring a total of 1550 tons of plates, by the Asiatic Petroleum Corp., Bayonne, N. J., with Chicago Bridge & Iron Co.

Federal Shipbuilding & Dry Dock Co., Kearny, N. J., has been formally awarded the contract for four cargo ships noted in recent issue as tentatively placed by the United States maritime commission; also Sun Shipbuilding Co., Chester, Pa., four.

**Pittsburgh** — The plate market is dull, with barges providing the main interest. Dravo Corp. is working on a number of hopper barges for stock and six barges for South American use, requiring about 500 tons of plates, were recently placed

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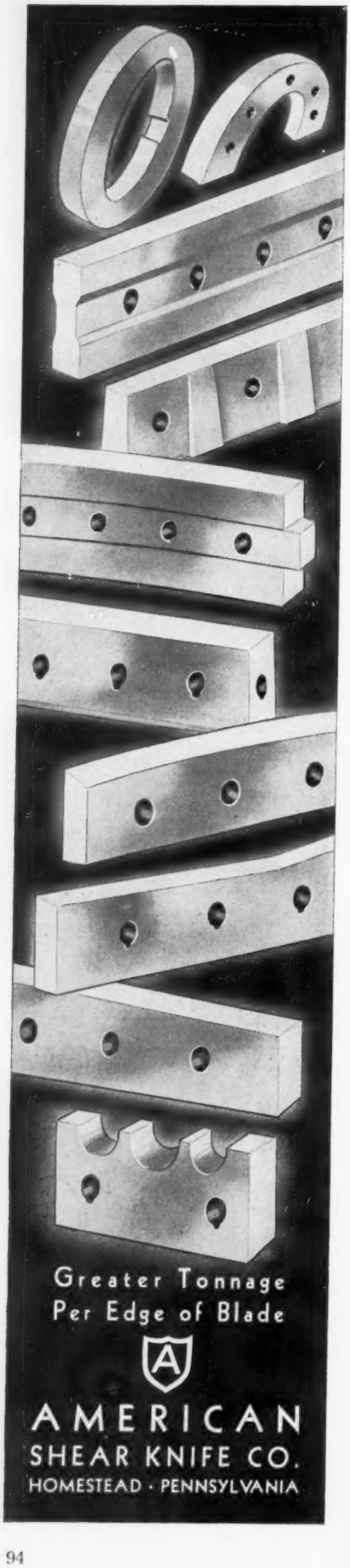


here with American Bridge Co. through United States Steel Products Co. The total tonnage on this job will be around 470 tons.

**Cleveland**—Demand for standard steel plates from private sources for small tank work or large industrial equipment remains on about the same level as for the last 30 days. Considerable tonnage will be required for four locomotives by the Akron, Canton & Youngstown railroad now on inquiry. Chicago Bridge & Iron Co., Chicago, is reported low on the first of three standpipes for Akron, O., requiring approximately 300 tons. Prices are unchanged.

**Chicago** — Plate business from structural fabricators has been quieter and sales to other users show little change. Prospects for an early increase in plate consumption for railroad equipment building are unfavorable despite availability of federal funds to finance such work. Plate consumption for tank fabrication is maintained fairly well. Plate deliveries continue a week to ten days.

**Boston**—Plate buying in small lots for immediate delivery accounts for current activity with few large specified projects active. Plans are being drawn for a 300,000-gallon water tank for Cape Cod, near Osterville, Mass. The Groton, Conn., yard is expected to figure in coming submarine awards in addition to the Portsmouth, N. H., navy yard. Boiler shops are doing little. Plate prices are inclined to weaken on some business, either through waiving of extras or other terms of selling, sellers in this district freely charging competitors with shading, although denying the allegations themselves.

**Philadelphia** — A nearby shipyard has released several hundred tons of plates to each of several mills for tankers booked several months ago. Steel releases against cargo boats recently awarded are not expected for 60 to 90 days. No further navy releases are expected although several thousand tons are pending for work already under way. Railroad buying for the first four months is 90 per cent under that of the same period in 1937.

**Birmingham, Ala.** — While miscellaneous plate buying continues slow, prospects of some increase in demand from car interests are brighter although demand from structural fabricators shows little improvement.

**San Francisco**—Interest centers in outcome of bids just opened by the East Bay municipal utility district, Oakland, Calif., for 25 and 36-inch welded steel pipe, calling for 800 tons of plates. Other sales and inquiries are for lots of less than 100 tons. So far this year 12,928 tons have been placed, compared with 24,444 tons for the same period last year.

**Seattle** — Demand for plates is dull and shops report only small tank and boiler jobs in hand. No important projects are up for immediate attention. Two reduction plants to be built soon at Grays Harbor, Wash., will require tanks but plans are not yet out. No announcement has been made regarding a large water storage tank for Pasco, Wash. Oil terminal extensions at Portland and Spokane will furnish small tonnages.

## Plate Contracts Placed

1550 tons, five 80,000-barrel tanks, Asiatic Petroleum Corp., Bayonne, N. J., to Chicago Bridge & Iron Co., Chicago.

510 tons, 1,000,000-gallon elevated tank, Keokuk, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

470 tons, 6 cargo barges for export market, to American Bridge Co., Pittsburgh, through United States Steel Products Co., New York.

300 tons, standpipe, city of Akron, O.; Chicago Bridge & Iron Co., Chicago, low on riveted, and Pittsburgh-Des Moines Steel Co. low on welded.

## Plate Contracts Pending

9000 tons, for 30 steel barges for department of sanitation, New York; Dravo Corp., Pittsburgh, low at $1,363,650, for own design.

Unstated tonnage, two steel dump scows, U. S. engineer, Huntington, W. Va.; bids June 6, circular 140.

Unstated tonnage, bulk oil storage plant, including tanks, Colonial Beacon Oil Co., Boston, for Portsmouth, N. H.

# Bars

Bar Prices, Page 86

**Pittsburgh**—Bar orders are coming in irregularly, although total figures show little fluctuation from the average of the past several weeks. Buying is still on a hand-to-mouth basis and immediate needs for manufacturing processes are not large enough to maintain a satisfactory production rate.

**Cleveland**—Producers of carbon and alloy steel bars note a slight falling off in specifications, due primarily to the gradually retrenchment in buying from agricultural implement manufacturers. This comparatively large consumer has been the most active purchaser over the past few months and now that the seasonal peak has passed it is to be expected a moderate easing in demand would be felt. Requirements from railroad equipment manufacturers and auto partsmakers have brighter although demand from the volume reported during April.

**Chicago**—Despite occasional improvement in bar demand from miscellaneous users, sales still are

tending downward and a continuation of this trend is in prospect for the balance of this month. Bar requirements of farm equipment manufacturers, however, still are better than average. Uncertainty over third quarter prices in some instances has been a definite deterrent.

**Boston**—While far from brisk, demand for bars, notably alloy and forging, is making a relatively better showing than most steel products. Small tools are slightly more active, although retail stocks of such goods and hardware have been such as to limit gains in shop production. Marine hardware shops continue fairly active consumers, but bolt and nut makers are confining purchases to fill-in needs.

**New York**—Bar specifications are declining, due possibly in part to interest now attached to impending announcement of prices for third quarter. Probably as at no time this year bar consumers are covering only for barest needs on the assumption that if there is a price reduction, they will be in better position to benefit. There have been no intimations by producers that prices will be reduced; nevertheless, sellers believe they have little to lose in waiting developments.

**Philadelphia**—Incoming bar tonnage is at the same rate as for the past fortnight. Inquiry is well diversified although industries affected by seasonal factors, such as the agricultural implement trade are most prominent. Prices are well maintained.

**Birmingham, Ala.** — Although business in bars continues below expectations, especially from manufacturers of agricultural implements, sufficient business is available to keep production on a relatively even keel.

# Pipe

**Pipe Prices, Page 87**

**Pittsburgh**—Pipe production is unchanged, near 40 per cent of capacity. Market picture is still dull and no grade is particularly active. Some casing and drill pipe have been moving to the southwest but only in small quantities and largely as filler for warehouse stocks.

**Chicago**—Low bidders have been announced on 3768 tons of cast pipe for Chicago. Inquiries elsewhere are fairly numerous but only a few large tonnages are included. Operations of producers are spotty and only small backlogs have been accumulated recently.

**New York**—Yonkers, N. Y., has closed on 890 tons of cast pipe, alternate bids being taken on 140 tons, involving a cement combination pipe. Buying is fairly active, but confined to miscellaneous lots for which prompt delivery is asked. New York city may advertise this week for several thousand tons for yard stocks.

**Boston**—Three projects, 530 tons of cast pipe, are being closed this week, for delivery at the Bridgewater, Mass., state farm, Brookline, Mass., and Boston, the latter for the Metropolitan district commission. Kingston, Mass., will shortly purchase additional pipe, probably cast, having experienced failures with a nonmetal pipe at an underwater crossing, which resulted in a political upheaval. Inquiry for wrought pipe is slightly better, more car lot tonnages appearing. Except for a few fair-sized building projects, steel pipe requirements are slow and routine, but steady.

**San Francisco**—New cast iron pipe inquiries, with one exception, were confined to lots of less than 100 tons. Lewiston, Idaho, has just taken bids on 1000 tons of 12 to 20-inch pipe.

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United States Pipe & Foundry Co. is low on 188 tons of 8-inch, Class 250 pipe for treasury department, San Francisco. So far this year 10,295 tons have been placed, compared with 15,252 tons for the same period a year ago.

**Cleveland**—Shipments of steel pipe from jobbers' stocks continues on about the same level as in April. In a few instances a slight falling off in specifications is noted. J. B. Clow & Son Co., Cleveland, booked 100 tons of 6-inch cast iron pipe for a water distribution system at Bellefontaine, O. Standard Oil of Ohio expects to place 3000 tons of 8-inch steel line pipe for a line running from Fostoria to Lima, O. Prices are firm.

**Birmingham, Ala.** — Pipe plants are barely holding their own. The curtailed three-day week generally remains, with specifications coming in small lots from widely scattered sources.

**Seattle**—Many Northwest towns await federal funds for proposed improvements but no important contracts are up for figures, Montana WPA projects approved include $238,182 for a water system and $40,500 for disposal plant at Lewistown; $29,091 for a water system at Boulder; $38,182 for a system at Whitehall; $13,500 for water system at Choteau and $40,000 for a system at Laurel.

## Cast Pipe Placed

285 tons, 6 to 12-inch, Westfield and Gardiner, Mass.; and Goffstown, N. H., to Warren Pipe Co., Everett, Mass.

100 tons, 6-inch, water distribution system, Bellefontaine, O., to J. B. Clow & Son Co., Cleveland.

## Cast Pipe Pending

3768 tons, Chicago; United States Pipe & Foundry Co., Burlington, N. J., low on 2463 tons of 12-inch; Glamorgan Pipe & Foundry Co., Lynchburg, Va., low on 855 tons of 8-inch and 450 tons of 16-inch.

219 tons, 4 to 20-inch, pit cast, Brookline, Mass.; bids in.

190 tons, 6 to 20-inch, cement-lined, metropolitan district commission, Boston; bids in; also approximately 62 tons castings.

188 tons, 8-inch, class 250, treasury department, San Francisco, invitation 5328, United States Pipe & Foundry Co., Burlington, N. J., low.

120 tons, 12-inch, Bridgewater, Mass., state farm; bids in.

100 tons, 6 and 8-inch, Central Point, Oreg.; bids May 24.

100 tons, 6-inch bell and spigot, Spokane; bids May 19.

Unstated tonnage, $100,000 waterworks and sewerage plant, Reedville, Wis.; bids May 21.

Unstated tonnage, 4200 feet of 12-inch Kenosha, Wis.; bids May 13.

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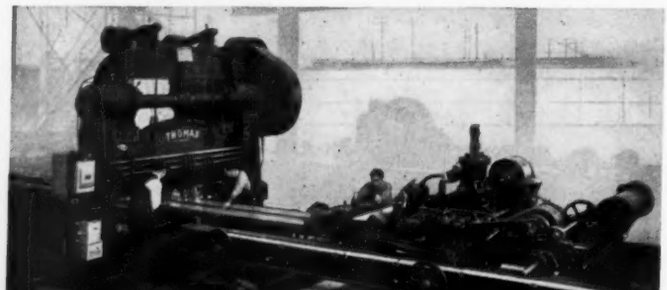

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# Wire

Wire Prices, Page 87

**Pittsburgh**—Merchant wire demand continues to decline but demand for other grades continues steady, indicating buying in manufacturers' grades is directly from production needs. Stocks generally are down to bottom and present rate is a good indicator of material now being manufactured.

**Chicago**—Business in wire and wire products shows only slight changes but is off moderately from the rate of 30 to 60 days ago. Consumption of manufacturers' wire has moderated in some directions while buying of wire products has passed the spring peak. Some price irregularity is reported on wire products.

**Boston**—While gaps in consumer inventories appear widening, wire buying has not materially increased. A few specialties are exceptions. Slow operations by major consuming industries, notably automobile and textile, retards tonnage volume, and most purchasing is for miscellaneous needs to fill unbalanced stocks.

**New York**—Demand for practically all wire products has leveled off, a slight seasonal improvement in wire rope highway railing and a fairly well sustained volume in merchant goods prevailing. Some consumers are also influenced by pending announcement of third quarter prices.

**Birmingham, Ala.** — Demand for wire products is somewhat better than for the past few weeks, but hardly what was expected at this season. Shipments are fairly steady but in small lots.

## Tin Plate

Tin Plate Prices, Page 86

**Pittsburgh**—Outlets for tin plate continue to hold up fairly well, with general line can activity especially heartening and possibility of a good crop year supporting the packers' can market. Export demand continues to augment the domestic market to a certain extent and indications are that this will continue. The production rate is approximately 55 per cent of capacity.

**New York**—Spot buyers of tin plate continue to hold off, pending clarifying action with respect to prices. This tendency became pronounced two or three weeks ago when the American Can Co. issued letters to its consuming trade, intimating weakness in tin plate prices and offering protection on yearly contracts.

Tin plate buyers who specify for

the more extended deliveries are not so much influenced by the present price situation. They believe that by the time specifications are due for delivery there will be at least a clarification and that if there is an early price reduction, they will be protected.

# Rails, Cars

**Track Material Prices, Page 87**

Steel for the 5550 freight cars recently placed by the Southern Railway will be distributed shortly, as soon, it is believed, as the car contracts are formally approved by the interstate commerce commission. More than 80,000 tons of steel, forgings and castings are involved.

Returns for April place domestic freight car buying at 15, the smallest number of cars since May, 1935, when only two cars placed. Total for the first four months is 829, against 40,765 in the corresponding period a year ago; 14,009 in the first four months of 1936 and 1180 in the same period of 1935. Further comparisons follow:

| | 1938 | 1937 | 1936 | 1935 |
|---|---|---|---|---|
| Jan. .... | 25 | 17,806 | 2,050 | 24 |
| Feb. .... | 109 | 4,972 | 6,900 | 806 |
| March.... | 680 | 8,155 | 632 | 0 |
| April..... | 15 | 9,772 | 4,427 | 350 |
| 4 mos..... | 829 | 40,765 | 14,009 | 1,180 |
| May .... ..... | | 4,732 | 8,900 | 2 |
| June .... ..... | | 548 | 5,200 | 5,151 |
| July .... ..... | | 1,030 | 7,229 | 500 |
| Aug. .... ..... | | 1,475 | 225 | 200 |
| Sept. .... ..... | | 1,216 | 1,750 | 875 |
| Oct. .... ..... | | 1,355 | 2,210 | 1,250 |
| Nov. .... ..... | | 275 | 1,550 | 100 |
| Dec. .... ..... | | 275 | 23,450 | 10,050 |
| Total . ..... | | 51,611 | 64,643 | 19,308 |

With the placing of the Southern list early this month, May is assured of the best monthly total since April of last year, when 9772 freight cars were placed by domestic lines.

Reconstruction Finance Corp. announces a loan of $2,116,161 to Seaboard Air Line to finance 90 per cent of the cost of nine diesel-electric locomotives, six passenger coaches and four mail-express cars. Equipment trust certificates at 4 per cent will be taken back by RFC as security for the loan.

## Rail Orders Placed

240 gross tons, 70-pound tee rail, municipal railway, San Francisco, to Bethlehem Steel Co., Bethlehem, Pa.

Erie, 10,967 tons for May, June, July delivery; distributed as follows: Carnegie-Illinois Steel Corp., 8556 tons; Bethlehem Steel Co., 1716 tons; Inland Steel Co., 695 tons.

## Buses Booked

American Car & Foundry Motors Co., New York: Twenty-one motor coaches for Southeastern Greyhound Lines, Lexington, Ky.; five for Union Bus Co., Jacksonville, Fla.; ten for Florida Motor Lines, Jacksonville, Fla.; ten for Boston Elevated Railway Co., Boston; five for Boston & Maine railroad, Boston; four for Maine Central Transportation Co., Portland, Me.; four for Baltimore Transit Co., Baltimore; one for Hart Bus Lines, Saugus, Me.

J. G. Brill Co., Philadelphia: Ten 39-passenger dual-motor trolley coaches for Peoples Railway Co., Dayton, O., following previous order for eight coaches; forty 44-passenger coaches for Columbus & Southern Ohio Electric Co., Columbus, O., following previous purchase of 20 coaches.

# Shapes

**Structural Shape Prices, Page 86**

**Philadelphia**—Pennsylvania highway department closed Friday on several hundred tons of structurals for small bridge jobs, and will take bids May 27 on further lots. Plans are nearing completion for the Delaware river bridge, Matamoras, Pa., costing $375,000, but no date has been set for bidding. Private work is slightly more active but jobs are for less than 100 tons.

**New York**—Two projects, taking 8000 tons have been bid, Manhattan land section, Queens-Mid-town tunnel and approach, for George Washington bridge, New York, the steel contracts to be awarded shortly. Inquiry and awards for private construction continue light. Only a part of the 15,000 tons required for board of water supply tunnels is due for early closing, considerable work by contractors being required before the larger portion is needed. General contracts have been awarded after a long delay. Fabricated steel prices are weak.

**Pittsburgh**—Several fair tonnages are pending and the total now awaiting placement is fairly large. Other projects are being planned and as soon as conditions are right, these will probably be released.

**Cleveland** — Structural awards from private sources are at comparatively low levels with individual projects well under 50 tons. Public work is considerably more encouraging with substantial tonnage for the Main street bridge here expected to be placed soon and inquiries for approximately 1500 tons for the cloverleaf development near Brecksville should come out soon. B. F. Perry, Akron, O., was low on 100 tons of sheet piling for a Mud run sewer project that city. Fabricated prices continue unchanged.

**Chicago**—Only a few structural


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jobs involving more than 100 tons are active, but several large projects are in prospect elsewhere. New inquiries number about 200, involving a total of only 16,000 tons. Dams in western and southwestern states account for a substantial portion of pending business. Chicago is preparing ordinances in hopes that a federal grant will be forthcoming to help finance three downtown subways costing $31,000,000.

**Boston** — Fabricated structural steel prices are erratic and tend lower with shops quoting under pressure from contractors. Awards are light, including 305 tons for Vermont bridges with an equal tonnage already estimated. More small spans are out for Maine and New Hampshire. Lyons Iron Works Inc., Manchester, N. H., is low on the steel for a state office building, Manchester, N. H.

**Buffalo**—Tapering in volume is apparent, but fabricators report many sizable jobs are in the preliminary stage. The State cancer clinic for Buffalo, involving 760 tons is up for bids Thursday.

**Seattle**—No important new projects have developed. Shops have only a fair amount of work in hand. Poole & McGonigle, Portland, have the subcontract to fabricate 1139 tons, for the Washington state Puget Island bridge. Business pending includes 250 tons for a high school at Moscow, Idaho.

## Shape Contracts Placed

8175 tons, Main avenue bridge, Cleveland, to R. C. Mahon Co., Detroit.

1139 tons, including cast steel, Washington state Puget Island bridge, to Poole & McGonigle, Portland, Oreg.; Parker & Schram, Portland, general contractor.

800 tons, building, Readers Digest, Pleasantville, N. Y., to Bethlehem Fabricators Inc., New York; through Edward Corning Co., New York.

472 tons, 11 bridges, scattered locations, Wisconsin; bids May 20.

435 tons, grandstand, East De Pere, Wis., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

420 tons, bridge over Trout river, Panama, Fla., for Seaboard Air Line, to American Bridge Co., Pittsburgh.

325 tons, shop building, Langley field, Virginia, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

260 tons, highway bridge, St. Onge, S. Dak., to Bethlehem Steel Co., Bethlehem, Pa.

235 tons, underpass, Kennapolis, N. C., to Southern Engineering Co., Charlotte, N. C.

225 tons, trash racks, Rutledge, Tex., to Muskogee Iron Works, Muskogee, Okla.

220 tons, warehouse, Woodward-Lathrop department store, Washington, to Fort Pitt Bridge Works, Pittsburgh.

210 tons, bridge SP10, Muhlenburg county, Kentucky, to Midland Structural Steel Co., Cicero, Ill.

195 tons, McAllister, Irasville and Sawmill bridges, I-beam spans, Waitsfield, Vt., to Vermont Structural Steel Corp., Burlington, Vt.; Bristol Construction Co. Inc., Bristol, N. Y., general contractor; bids April 22; at $42,885.90.

185 tons, bridge, RC 3950, Oneida county, New York, to Harris Structural Steel Co., New York; S. A. Scullen Inc., Cohoes, N. Y.

160 tons, formed plates, press shop, Ford Motor Co., Dearborn, Mich., to Whitehead & Kales Co., Detroit.

150 tons, store, Montgomery Ward & Co., Lexington, Ky., to International Steel Co., Evansville, Ind.

150 tons, bridge No. 0.2.5, Wabash railway, Hannibal, Mo., to Bethlehem Steel Corp., Bethlehem, Pa.

150 tons, store building, G. C. Murphy Co., Beaver Falls, Pa., to Pittsburgh Bridge & Iron Co., Pittsburgh.

130 tons, I-beam span, Pottawattomie county, Kansas, to Des Moines Steel Co., Des Moines, Iowa.

130 tons, addition to building 708, Murray Corp. of America, Ecorse, Mich., to Whitehead & Kales, Detroit.

110 tons, Irasburg and Vershire, Vt., I-beam spans, to Bethlehem Steel Co., Bethlehem, Pa.; Warnard Constructors Inc., Cambridge, Mass., general contractor; bids April 29.

100 tons, building for National Broadcasting Co., Los Angeles, to Austin Co., Cleveland.

100 tons, Y. M. C. A. building, World's fair, New York, to F. G. Schaefer Iron Works, Edgewater, N. J.; through John H. Eisele Co., New York.

100 tons, alterations to Philharmonic auditorium, Los Angeles, to Pacific Iron & Steel Co., Los Angeles.

## Shape Awards Compared

| | Tons |
|---|---|
| **Week ended May 14** | **14,576** |
| **Week ended May 7** | **5,615** |
| **Week ended April 30** | **22,349** |
| **This week, 1937** | **14,946** |
| **Weekly average, year, 1937** | **16,060** |
| **Weekly average, 1938** | **16,004** |
| **Weekly average, April** | **24,340** |
| **Total to date, 1937** | **534,778** |
| **Total to date, 1938** | **320,080** |

Includes awards of 100 tons or more.

## Shape Contracts Pending

14,750 tons, shafts and tunnels, Delaware aqueduct, Putnam and Westchester counties, New York, board of water supply project; six general contracts awarded as follows: S. A. Healy Co., contracts 324 and 307; J. F. Shea Co. and Henry J. Kaiser Co., contract 308; Utah Construction Co., contract 322; Seaboard Construction Co., contract 323; B. Perini & Son Inc., contract 339. Other steel quantities include: 950 tons plates, inner lining and risers; 500 tons steel piling; 950 tons reinforcing bars; 93,000 feet steel pipe, up to 2½-inch diameter for grouting.

6500 tons, Manhattan land section, Queens midtown tunnel, New York, Woodcrest Construction Co., New York, low; bids May 10, New York tunnel authority.

2200 tons, transmission towers, Chickamauga dam, Tenn., to Guntersville dam, Ala.; bids May 26, Tennessee Valley authority, Knoxville, Tenn.

1560 tons, approach alterations, widening and ramps, George Washington bridge, New York side; Walter Kidde Constructors Inc., New York, low; bids May 10 to Port of New York authority.

1500 tons, manufacturing building, Toledo Scale Co., Toledo, O.

1400 tons, steam plant, Consumers Power Co., Comstock, Mich.

1250 tons, Oklahoma highway projects, including 1000 tons for bridge at Oklahoma City; bids May 24.

1200 tons, Guntersville power house, Tennessee Valley authority, Knoxville, Tenn.; bids May 26.

1000 tons, Little Rock, Ark., municipal auditorium; bids May 24.

600 tons, building, Supreme Sugar Refining Co., Napoleonville, La.

550 tons, Olentangy village housing project, L. L. LeVeque Co., Columbus, O.

460 tons, Eagan Hills Garden apartments, F. A. Schmidt Co., Cincinnati.

388 tons, subway, Lincoln, Nebr., Chicago, Burlington & Quincy railroad.

375 tons, warehouse, Anchor Hocking Glass Corp., Salem, N. J.

350 tons, coal tipple and washer, United States Fuel Co., Kingmine, Utah.

310 tons, state bridge, Chemung county, New York.

290 tons, state office building, Concord, N. H., E. J. Pinney Co., Springfield, Mass., low on general contract; Lyons Iron Works Inc., Manchester, N. H., low on steel at $20,747, fabricated and delivered to site, but not erected.

280 tons, building, Yerba Buena Island, San Francisco, for fair.

250 tons, nurses' home, Shelton, Conn., for state.

237 tons, three span I-beam bridge and highway, Bennington, Vt.; Carlo Bianchi & Co. Inc., Framingham, Mass., low on general contract at $80,000.72, bidding $16,430 on steel bridge, lump sum.

200 tons, school, Cuba, N. Y., L. C. Whitford, Wellsville, N. Y., low bidder on general contract.

200 tons, school building No. 9, Rome, N. Y.

180 tons, state bridge FAP-243-J, Pagosa Springs, Colo.

170 tons, bridges, Wentworth and Danbury, N. H.; B. A. Gardetto Inc., Boston, and O. W. Miller Co. Inc., Ludlow, Mass., low, respectively.

150 tons, power plant, Northern Paper Mills, Green Bay, Wis.

125 tons, shop building, Byron Jackson Co., Houston, Tex.

110 tons, warehouse, J. G. Pieri Co., Buffalo, Joseph Lureachia, Buffalo, low bidder, general contract.

100 tons, highway bridge, Cass county, Missouri; bids Missouri highway commission, Jefferson City, due May 20.

100 tons, bridge, Narraguagus river, Milbridge, Washington county, Maine; bids May 25, state highway commission, Auburn, Me.

100 tons, sheet piling, Mud Run sanitary sewers, for city of Akron, O.; B. F. Perry, Akron, O., low.

# Reinforcing

**Reinforcing Bar Prices, Page 87**

**New York** — Quotations are in on 1700 tons for a tunnel section and bridge approach, New York, with steel to be placed shortly. Meanwhile buying is light and in small tonnages. Highway mesh demand tends upward, with several hundred tons being placed and more than 1500 tons bid and pending. Prices, untested by large tonnages, are generally steady in small-lot transactions.

**Pittsburgh** — The price situation is still cloudy, although tonnages are holding up well. In addition to the projects reported, there have been numerous smaller projects involving lesser tonnages.

**Cleveland**—Demand for reinforcing steel from private sources has failed to register improvement. Most projects are limited to lots well under 100 tons. Requirements from public sources are more encouraging. Marro Construction Co., South Euclid, O., is reported low on 250 tons of rail steel for a storm outlet, West Market street-Hawkins avenue, Akron, O. The reinforcing bars for the two river piers and nine land piers for the Main street bridge project, Cleveland, are still pending.

**Boston** — Including small lots contracts involve approximately 1000 tons, 438 tons for machine shop foundations, Everett, Mass., being the largest. Inquiries are slightly heavier, notably small lots, while Fred T. Ley & Co., Springfield, Mass., is purchasing 375 tons for sewage pumping stations, that city. Connecticut closed on general contracts for highways, May 9, taking 450 tons, mostly mesh.

**Philadelphia**—Except for the appearance of slightly more private work, reinforcing market displays little life. Bethlehem Steel Co., Bethlehem, Pa., booked 1750 tons for Woodward-Lathrop warehouse, Washington, which was the only large job. Bids are due soon on a hospital at Laurel, Md., taking about 100 tons.

**Chicago** — Concrete bar inquiries are steady and sales are being maintained at recent levels despite absence of many large individual lots. Early award of 1500 tons for a sanitary district pumping station is anticipated.

**San Francisco** — While mills at South San Francisco and Seattle are reported closed some slight improvement in demand is noted and awards placed during the past week aggregated 2053 tons, bringing the total for the year to 37,932 tons compared with 33,520 tons in 1937.

**Seattle** — Substantial tonnages are lacking, and rolling mill operations are desultory but prices are firm and steady. Industrial demand is at a standstill with awards mostly for public works. Bethlehem Steel Co., Seattle, booked 200 tons for a hospital and school at Anchorage, Alaska, and 200 tons involved in a state crossing, Colfax county, and state paving jobs. About 1000 tons are pending in

Washington road projects and a school at Moscow, Idaho.

## Reinforcing Steel Awards

1750 tons, Woodward-Lathrop Co., warehouse, Washington, to Bethlehem Steel Co., Bethlehem, Pa.; through Turner Construction Co.. New York, general contractor.

600 tons, Central Nebraska public power and irrigation canal, Hastings, Nebr., to Sheffield Steel Corp., Kansas City, Mo.

453 tons, bureau of reclamation, invitation 48,129-A, Corbett, Wyo., to Carnegie-Illinois Steel Corp., Chicago.

438 tons, foundations, engine and machine shop, Boston Elevated railroad, Everett, Mass., to Concrete Steel Co., New York; C. J. Maney Co. Inc., Boston, general contractor.

350 tons, ward, state hospital, Agnew, Calif., to Ceco Steel Products Corp., San Francisco.

350 tons, Sisters of Mercy hospital, Detroit, to Pollak Steel Co., Cincinnati, through Walter Butler Co., St. Paul, general contractor.

338 tons, State Products Terminal building, San Francisco, to Soule Steel Co., San Francisco.

## Concrete Bars Compared

| | Tons |
|---|---|
| **Week ended May 14** ..... | **7,772** |
| **Week ended May 7** ..... | **2,904** |
| **Week ended April 30** ..... | **8,003** |
| **This week, 1937** ..... | **17,769** |
| **Weekly average, year, 1937** | **6,266** |
| **Weekly average, 1938**..... | **5,711** |
| **Weekly average, April**..... | **8,512** |
| **Total to date, 1937** ..... | **99,334** |
| **Total to date, 1938** ..... | **114,222** |

Includes awards of 100 tons or more.

300 tons, plant, Coca Cola Bottling Co. of Chicago, to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, Springfield dial and office building, Springfield, Ill., to Laclede Steel Co., St. Louis.

300 tons, flood control, Topeka, Kans., to Sheffield Steel Corp., Kansas City, Mo.

300 tons, water works, Leavenworth, Kans., to Sheffield Steel Corp., Kansas City, Mo.

252 tons, bureau of reclamation, invitation A-22,262-A, Mills, Wyo., to Colorado Fuel & Iron Corp., Pueblo, Colo.

240 tons, highway mesh, Eastern state parkway, section 4, Dutchess county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; through C. R. McKay, Hempstead, N. Y., general contractor.

200 tons, bridge, Martindale, Mont., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, hospital and school, Anchorage, Alaska, to Bethlehem Steel Co., Seattle; MacDonald Construction Co., Seattle, general contractor.

200 tons, Washington state overcrossing and paving projects, to Bethlehem Steel Co., Seattle.

200 tons, manufacturing building, Westinghouse Electric & Mfg. Co., Springfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa.

140 tons, bridge 1616, Greenfield, Ind., to Bethlehem Steel Co., Bethlehem, Pa.

120 tons, post office, Stoughton, Wis., to Joseph T. Ryerson & Sons, Chicago.

120 tons, bureau of reclamation, invitation A-22,257-A, Mills, Wyo., to Colorado Fuel & Iron Corp., Pueblo, Colo.

120 tons, blower house, Back river sewage disposal plant, Baltimore, to Bethlehem Steel Co., Bethlehem, Pa.

101 tons, bridge, Los Angeles county, California, for state, to unnamed interest.

100 tons, Northern Paper Mills, Green Bay, Wis., to Joseph T. Ryerson & Sons, Chicago

100 tons, alterations to Philharmonic auditorium, Los Angeles, to unnamed interest.

100 tons, church, Norwood, O., to Pollak Steel Co., Cincinnati, through Ed. Honnert, general contractor, Cincinnati.

100 tons, bridges and highways, Orfort and Bridgewater, N. H., to Concrete Steel Co., New York; Lane Construction Co., Meriden, Conn., general contractor, both projects.

## Reinforcing Steel Pending

1500 tons, Racine avenue pumping station, Chicago sanitary district; M. J. Boyle Construction Co., Chicago, general contractor.

1330 tons, approach alterations, widening and ramps, George Washington bridge, New York side, Walter Kidde Constructors Inc., New York, low; bids May 10 to Port of New York authority.

500 tons, High Commissioner's office, Manila, P. I.; Marsman Building Corp., Manila, low.

460 tons, state spans in Pullman and Thurston counties, Washington; bids at Olympia, May 24.

409 tons, gymnasium, George Washington high school, San Francisco; bids rejected.

400 tons, highway bridge, Oklahoma City, Okla.; bids May 24.

375 tons, sewage pumping station, Springfield, Mass.; Fred T. Ley & Co., Springfield, low.

375 tons, Manhattan land section, Queens mid-town tunnel, New York; Woodcrest Construction Co., New York, low; bids May 10.

350 tons, sewage disposal plant, Springfield, Mass.

350 tons, bridge, Highland park, Pittsburgh.

313 tons, spillway, Central Nebraska Public Power & Irrigation district, Hastings, Nebr.; bids May 27.

308 tons highway work and bridges, Merced county, California, for state; bids May 25.

285 tons, invitation 1174-38-169, army engineers' office, Baltimore; Bethlehem Steel Co., Bethlehem, Pa., low bidder.

284 tons, United States engineer office, invitation 868-38-141, San Francisco; Soule Steel Co., San Francisco, low.

281 tons, 11 bridges, scattered locations, Wisconsin; bids May 20.

275 tons, foundations, state highway route 3 and Prospect avenue, North Bergen, N. J., Lincoln tunnel approach, contract MHT-73; bids June 7 to Port of New York authority; also 6300 linear feet steel piling, optional to contractor.

250 tons, intercepting sewer, Bronx, N. Y.; bids May 17.

250 tons, rail steel, storm outlet, West Market street-Hawkins avenue, Akron, O.; Marro Construction Co., South Euclid, O., low.

185 tons, mostly mesh, 8710 feet, reinforced concrete highway, Waterbury, Conn.; bids May 23, Hartford, plans New Milford residency.

140 tons, high school, Iowa City, Iowa.

135 tons, Boise reclamation project, Emmett, Idaho.; bids at Boise, May 31.

121 tons, structures for Payette division, Boise project, Idaho, specification 185; bids for placing May 31.

120 tons, bridge, route 90, Marshall county, Lacon, Ill.

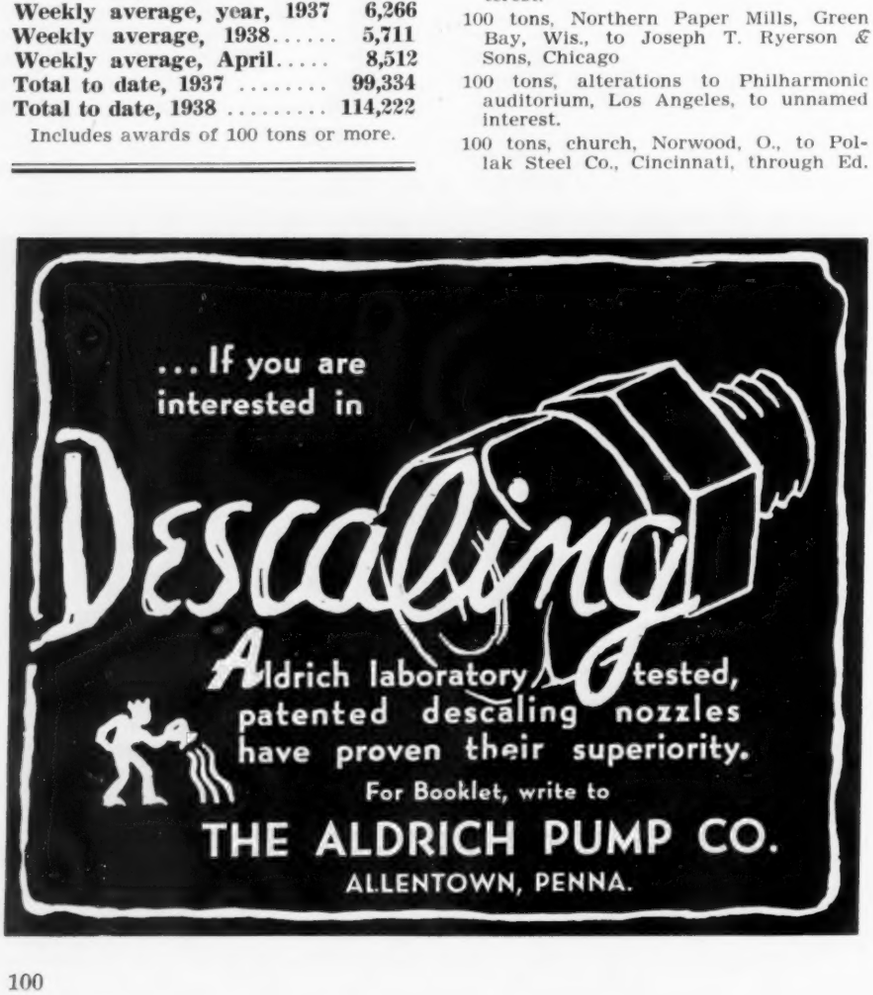
110 tons, pumping station, Green Bay, Wis.

110 tons, highway work in Stanislaus county, California, for state; bids May 18.

100 tons, hospital and administration building, Laurel, Md.; bids soon.

100 tons, post office, Lihue, T. H.; bids opened.

100 tons, state office building, Concord, N. H.; E. J. Pinney Co., Springfield, Mass., low.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ALLENTOWN, PENNA.

100 tons, Danforth street railroad crossing over terminal tracks, Portland, Me.; bids May 18.
Unstated tonnage, 135-foot overcrossing, Payette county, Idaho; bids at Boise, May 20.

# Pig Iron

Pig Iron Prices, Page 88

**Pittsburgh**—Outlook in the local pig iron market is unchanged. Demand is practically non-existent, and although a few carload orders are moving, no large tonnages have been booked for some time. Foundry activity continues at a low level, although there seems to be some possibility of better orders from railroad suppliers in the near future.

**Cleveland**—Merchant sellers report buying continues on a hand-to-mouth basis, with a slight falling off in tonnage shipped this month. This slight easing in demand is due to moderate curtailment in operations among agricultural equipment foundries. Household equipment and automotive foundries continue on approximately the same volume as in April. Prices are unchanged.

**Chicago**—Pig iron producers are not expected to announce third quarter prices before next month. The market recently has been steady but the $24 furnace, price for No. 2 foundry and malleable has been tested by only small lot purchases as foundries are wary of the price situation and generally are ordering for only a short time ahead.

**Boston**—Pig iron buying continues slack, few car lots being sold, bulk of slow business being in truck lots. Foundries are operating at low rates almost without exception. Those with stocks are drawing from such supplies and replacing only what is urgently needed. Larger users still draw on inventories without replacement. The Springfield, Mass, district valve maker and the Everett pipe foundry are operating better than the average.

**New York**—Indications point toward reaffirmation of third quarter pig iron prices. Some leading producers stress higher operating costs, low consumer stocks and relatively low stocks at the furnaces. Heavy exports last year, they point out, helped some furnaces as far inland as Chicago to materially reduce their piles, and, further, furnaces lost little time in blowing out when downward trend in business became fully apparent.

Reimposition by Great Britain of a 33 1/3 per cent duty on pig iron, effective May 13, will have little bearing on the present trend of purchases from the United States.

**Philadelphia**—Sellers are encouraged over reports of slightly accelerated activity among jobbing foundries, which leads to the belief the trade may be scraping bottom.

**Buffalo**—Pig iron producers are again accumulating iron to maintain present operations. Sales are limited to a few scattered carlots and a light flow of small orders. With melting at a low rate foundries are buying to cover immediate requirements only. One interest which was expected to blow in a stack about this time in all probability will not resume production until some time after the end of May.

**Cincinnati** — Pig iron shipments this month are in unchanged volume from April. No trend is discernible but may be downward. Foundries continue on light melting programs and take iron only for their needs. The one district furnace in blast on merchant iron is building inventory, demand being inadequate to absorb output.

**St. Louis**—Pig iron shipments are holding close to April's daily average. Defection in melt by steelmakers has been counterbalanced by slight increases in stove industry and among jobbing foundries.

**Birmingham, Ala.** — Pronounced dullness has developed in pig iron and blast furnace operations have dropped to a total of only 7 with removal this week by T. C. I. of two furnaces.

**Toronto, Ont.**—While there was little or no change in business in the Canadian pig iron markets for the past week, prospects are favorable for increased demand soon. Gun orders amounting to $5,000,000 have been placed with John Ingles Co., steel to be furnished by Atlas Steels Ltd., Toronto.

# Scrap

Scrap Prices, Page 90

**Pittsburgh** — The Pittsburgh scrap market is still weak, with no interest shown by consuming mills. The steel production rate does not indicate that there will be much improvement soon. Prices on open-hearth grades remain unchanged in the absence of sales, although prices on the whole list are nominal. Little scrap was sold from recently closed railroad lists. Specialty prices are somewhat weaker.

**Cleveland** — Some releases are being received but cover only small lots. This material is said to be for shipment to Warren, O. Little new business is going.

Some quotations have been lowered on steel scrap at Youngstown, and also on heavy cast scrap at Cleveland, about 50 cents in each case. Except for this, quotations generally are unchanged.

**Philadelphia**—Several grades of scrap are down 50 cents but the market apparently is reaching a resistance level. Prices are at a point dealers regard as unprofitable for handling, as costs are high. Offerings to yards are off 70 per cent.

**Chicago**—Dullness in scrap persists and with steelmaking declining and additional mills out of the market, the trade

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COLD DRAWN
SHAPES

For 39 years we have been drawing steel to our *customers'* specifications. We provide experience, accuracy, the best of finish and the heat treatment just right for the job, an "efficiency" product.

*A chart of decimal equivalents will gladly be sent you upon request.*

KIDD DRAWN STEEL CO.
Aliquippa, Pa.
(Pittsburgh District) Phone: Aliquippa 196

is looking for lower prices. Heavy melting steel nominally is unchanged at $11 to $11.50, with bids by brokers somewhat lower the past week. Quotations on several railroad grades have declined 50 cents.

**Boston** — Lower prices for iron and steel scrap are based on small lot shipments to district foundries, stove plate, No. 1 machinery cast, textile and No. 2 cast being weaker. Having covered for immediate export needs, brokers are not buying much for dock delivery, with No. 1 heavy melting ranging from $10 to $10.50 and No. 2 one dollar less docks.

**New York** — Widespread markdown in iron and steel scrap, most grades being included, brings No. 1 heavy melting steel to $9.50 docks, a decline of $1.50 a ton. Other grades for export are also lower, stove plate being quoted $6, docks, and No. 2 cast $7. For domestic consumption and district delivery, including cast grades, brokers have lowered bids on most scrap from 50 cents to $1.50 a ton.

**Buffalo** — With the principal consumer dropping its bid on No. 1 heavy melting steel to $11 a ton, the entire scrap list was subject to a downward adjustment averaging 50 cents.

**Detroit**—Several cars of scrap were offered for bids by Hudson this week, but prices showed no pronounced change, ten cars of borings and turnings going at current quotations.

**Cincinnati** — The iron and steel scrap market remains dull. Mills are not buying and other outlets are virtually closed. Quotations have become academic, so restricted are activities.

**St. Louis**—Apathy and weakness continue in iron and steel scrap and outlook for betterment during the next few weeks is not promising.

**Toronto, Ont.** — Trading in iron and steel scrap is slow, with only special grades attracting attention. The recent reduction of $1 per ton has not been reflected in increased demand, but has tended to slow offerings by collectors. Hamilton mills are in the market for heavy melting steel but owing to limited supplies available local dealers are making only irregular shipments. Foundries are taking machinery cast and stove plate as offered but supplies are limited and dealers have little to offer.

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CHAS. H. LOTT
*Manager*

*Every Room Outside with Private Bath*
**Single from $2.50**
**Double from $4.00**

DETROIT LELAND HOTEL

**CASS AT BAGLEY AVE. GARAGE IN CONNECTION**


# Warehouse

**Warehouse Prices, Page 89**

**New York**—Warehouse volume thus far in May is about at the April rate, but indications are May tonnage will fall slightly behind. Incoming business is spotty, with large orders few. Industrial consumers are buying sparingly. Warehouse stocks as a rule are better balanced and jobbers are placing small orders with mills to fill open spots in stock slightly more freely.

**Boston**—Orders in some sections of New England are encouraging, but are small individually. Tonnage volume of sales thus far in May is slightly under April. Volume varies considerably in the various centers.

**Philadelphia**—Steel sales out of warehouse are none too active but show no decline. Slightly more interest is shown in reinforcing bars and mesh for building work. Prices are well maintained in all lines except galvanized sheets.

**Buffalo** — Warehouse distributors are showing a bit of encouragement over the manner in which sales are clinging to the level of the previous month. In view of business conditions, sales volume on par with April for the current month would be highly satisfactory. Prices are fairly steady, but an occasional hint of easiness appears in sheets.

**Cleveland**—Sales and shipments out of warehouse have varied only slightly this month. Order volume has maintained fair proportions but individual tonnages continue disappointing. Outlook over the remainder of the month is expected to show little change with the general expectation that total tonnage will fall behind April. Prices are unchanged.

**Chicago**—Sales show a slight decrease since a month ago, the letdown during the past 30 days having been somewhat less than seasonal. Business is fairly close to the 1936 rate despite a marked falling off since a year ago.

**Cincinnati**—Tapering in warehouse sales has appeared, on receding industrial demand. Two factors are disappointing, the light requirements for building materials and the tardy calls for steel from the coal mining industry. Some minor price adjustments because of freight rate revisions are imminent.

## 100% Inspection for J & L Seamless Pipe

■ A new policy of 100 per cent inspection of each length of seamless casing, tubing and drill pipe is now in force in Jones & Laughlin Steel Corp. tube mills.

The company in the past has subjected all oil country products to inspections before shipments to make certain they were well within A. P. I. specifications. Introduction of 100 per cent inspection now involves inspection of every length of pipe rolled for surface perfection, uniformity of wall thickness, trueness to round, trueness to size, straightness and general quality.

Each threaded end is inspected for taper, depth, pitch and size to insure tight, dependable, leakproof and rapid make-up in the field.

## Semifinished

**Semifinished Prices, Page 87**

Semifinished steel demand is lagging as production schedules at nonintegrated mills show no sign of an increase. Demand has dropped off somewhat from last week and is still spotty, with only occasional

shipments released as orders are received by smaller mills. There seems to be no grade of semi-finished for which any particular activity can be noted. Mill schedules continue more or less irregular.

## Steel in Europe

**Foreign Steel Prices, Page 89**

**London**—(*By Radio*)—Production of steel and iron fell off in Great Britain in April. Steel ingot output was 938,600 gross tons compared with 1,115,800 in March. Pig iron production was 661,000 tons, compared with 714,000 tons in March. Active blast furnace stacks at the end of April numbered 111, compared with 118 at the end of March.

Import duty of 33 1/3 per cent on imports of all foreign pig iron has been reimposed, effective May 13.

Exception is made of iron smelted entirely with charcoal, vanadium and titanium iron, pig iron produced in the electric furnace and a special type of iron containing cobalt. These grades continue duty free.

This question has been before the import advisory committee for some time as the industry sought protection against foreign competition when home markets were contracting. Prices for third quarter are awaited by consumers. It is reported the government may build emergency stocks of pig iron, which would stimulate and maintain production. The steel position is little changed, with sheet and tube mills working only part time.

The Continent reports an agreement has been reached in the international steel tube cartel, including Poland. Steel export markets are mildly active, especially to Manchukuo and the Near East.

Constitution of a cartel of Continental producers of cold-rolled strip is reported assured, with quotas of 50 per cent for Germany, 30 per cent for Belgium, 12 per cent for France and 8 per cent for Luxembourg.

## Ferroalloys

**Ferroalloy Prices, Page 88**

**New York**—Following closely the trend in steel output, ferromanganese shipments are easing off. Some sellers look for May to be lower than April. This also applies to domestic spiegeleisen, which is moving the slowest in many weeks.

Meanwhile, prices are unchanged at $102.50, duty paid, Atlantic and Gulf ports, for ferromanganese, and $33, Palmerton, Pa., for 19 to 21 per cent spiegeleisen and $39 for 26 to 28 per cent.

## Iron Ore

**Iron Ore Prices, Page 90**

**New York**—Tungsten ore prices continue to drop in Europe and this is reflected here, where buying is at a standstill, in a nominal quotation of $15.75, duty paid, as against $16.25 recently for Chinese wolframite. Weakness in Europe is attributed mainly to the passing of the war scare, which has resulted in the liquidation of speculative stocks; also in freer offering of the ore in China.

Foreign iron ores are holding nominally unchanged. A fairly well sustained demand still prevails in Europe and with consumers on this side well stocked, sellers are making little effort to develop business here by offering concessions.

In some well informed quarters it is believed that bona fide offers by consumers here would bring out lower prices, but how much is a question, and it would depend upon the particular grade of ore. Low phosphorus ores appear particularly steady at the moment. It is believed the principal factor in any reduction would be the ocean freight rates, which continue to ease off.

**Cleveland**—Vessel freight rates on iron ore shipments on the Great Lakes this season will remain unchanged. This was made known with the announcement that one of the large shippers had closed for his vessel capacity at last year's rates which follow:

From Duluth-Superior to lower lakes the rate is 80 cents a ton; from Marquette to lower lakes 72 cents; from Escanaba to Lake Erie 60 cents, and from Escanaba to Chicago 48 cents.

Prices for iron ore have not yet been determined.

Receipts of iron ore at lower lake ports for this season to May 1, shipments to interior furnaces, and dock balances follow:

| Port | Receipts | Shipments | Dock bal. May 1,'38 |
|---|---|---|---|
| Buffalo | 6,084 | 897 | 107,677 |
| Erie | 10,074 | 10,134 | 286,287 |
| Conneaut | | 16,447 | 1,876,004 |
| Ashtabula | | 64,029 | 1,536,764 |
| Fairport | | | 480,218 |
| Cleveland | 7,557 | 7,100 | 591,936 |
| Lorain | | | 246,842 |
| Huron | | | 217,175 |
| Toledo | | 3,327 | 52,606 |
| Total | 23,715 | 101,934 | 5,395,509 |
| Year ago | 1,829,761 | 2,069,829 | 2,336,653 |

Receipts at other than Lake Erie ports for April follow:

| | Tons |
|---|---|
| Indiana Harbor | 74,315 |
| South Chicago | 31,603 |
| Totals | 105,918 |
| Year ago | 769,951 |

## Bolts, Nuts, Rivets

**Bolt, Nut, Rivet Prices, Page 87**

Bolt, nut and rivet specifications are lighter, reflecting decreased consumption among miscellaneous users and smaller requirements of farm equipment builders. Railroad demand shows a decrease, particularly marked compared with a year ago when railroad equipment building and repair work was active. Irregularity in prices continues.

TUBE MILL EQUIPMENT OF MODERN DESIGN

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McKEES ROCKS, PA.

## Steel Imports Are Light

**Philadelphia** — Ore importations here during the week ended May 7 involved 7788 tons of chrome ore, 5335 coming from the Philippine Islands and 2453 from South Africa.

Steel importations comprised 204 tons of structural shapes, 62 tons of steel bands and 33 tons of steel bars from Belgium; and 56 tons of steel forgings, 48 tons of steel bars and 23 tons of steel tubes, from Sweden.

## Nonferrous Metal Prices

*Spot unless otherwise specified. Cents per pound*

| | Copper | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| May | Electro, del. Conn. | Lake, del. Midwest | Casting, refinery | Straits Tin, New York Spot | Straits Tin, New York Futures | Lead N. Y. | Lead East St. L. | Zinc St. L. | Aluminum 99% | Antimony Amer. Spot, N.Y. | Nickel Cathodes |
| 7 | 10.00 | 10.12½ | 9.52½ | 38.00 | 38.15 | 4.50 | 4.35 | 4.15 | 20.00 | 12.75 | 35.00 |
| 9 | 10.00 | 10.12½ | 9.52½ | 37.85 | 38.00 | 4.50 | 4.35 | 4.15 | 20.00 | 12.75 | 35.00 |
| 10 | 10.00 | 10.12½ | 9.52½ | 38.00 | 38.15 | 4.50 | 4.35 | 4.00 | 20.00 | 12.75 | 35.00 |
| 11 | 10.00 | 10.12½ | 9.52½ | 37.80 | 37.95 | 4.50 | 4.35 | 4.00 | 20.00 | 12.75 | 35.00 |
| 12 | 10.00 | 10.12½ | 9.52½ | 38.25 | 38.40 | 4.50 | 4.35 | 4.00 | 20.00 | 12.75 | 35.00 |
| 13 | 10.00 | 10.12½ | 9.52½ | 38.05 | 38.20 | 4.50 | 4.35 | 4.00 | 20.00 | 12.75 | 35.00 |

**MILL PRODUCTS**

*F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.00c Conn. copper*

**Sheets**

Yellow brass (high) ..... 16.37½
Copper, hot rolled ..... 18.12½
Lead, cut to jobbers ..... 7.75
Zinc, 100-lb. base ..... 9.75

**Tubes**

High, yellow brass ..... 19.12½
Seamless copper ..... 18.62½

**Rods**

High yellow brass ..... 12.37½
Copper, hot rolled ..... 14.62½

**Anodes**

Copper, untrimmed ..... 15.37½

**Wire**

Yellow brass (high) ..... 16.62½

**OLD METALS**

*Nom. Del. buying prices*

**No. 1 Composition Red Brass**

New York ..... 5.97½-6.10
Cleveland ..... 6.25-6.50
Chicago ..... 5.25-5.50
St. Louis ..... 5.37½-5.62½

**Heavy Copper and Wire**

New York, No. 1 ..... 7.00-7.25
Cleveland, No. 1 ..... 7.00-7.25
Chicago, No. 1 ..... 7.00-7.25
St. Louis ..... 6.75-7.00

**Composition Brass Borings**

New York ..... 5.60-5.72½

**Light Copper**

New York ..... 5.50-5.75
Cleveland ..... 5.50-5.75
Chicago ..... 5.00-5.25
St. Louis ..... 5.00-5.25

**Light Brass**

Cleveland ..... 3.25-3.50
Chicago ..... 3.25-3.50
*St. Louis ..... 3.00-3.25

**Lead**

New York ..... 3.50-3.75
Cleveland ..... 3.25-3.50
Chicago ..... 3.00-3.25
St. Louis ..... 2.75-3.00

**Zinc**

New York ..... 1.75-1.87½
Cleveland ..... 1.75-2.00
St. Louis ..... 1.75-2.00

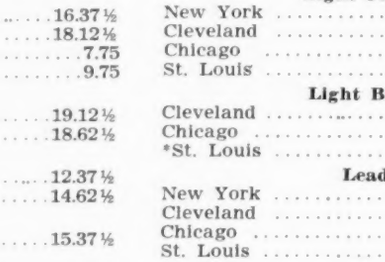
**Aluminum**

Borings, Cleveland ..... 3.75-4.00
Mixed, cast, Cleveland ..... 6.75-7.00
Clips, soft, Cleveland ..... 11.25-11.50
*Mixed cast, St. Louis ..... 7.00-7.25

**SECONDARY METALS**

Brass ingot, 85-5-5-5, less carloads .. 10.25
Standard No. 12 aluminum .... 14.25-14.75


*at the*
**CROSSROADS**

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*Fay B. Mareness, Mgr.*


## Steel Corp. Shipments in April 12% Below March

■ Shipments of finished steel by the United States Steel Corp. in April were 501,972 tons, a decrease of 70,227 tons, or 12 per cent, from 572,199 tons in March. They were 841,672 tons, or 62.6 per cent, less than 1,343,644 tons shipped in April, 1937.

For four months aggregate shipments were 2,067,216 tons, compared with 5,041,685 tons in the corresponding period of 1937, a loss of 2,974,469 tons, or 59 per cent.

**U. S. STEEL CORP. SHIPMENTS**
(Inter-company shipments not included)
(Tons)

| | 1938 | 1937 | 1936 | 1935 |
|---|---|---|---|---|
| Jan. | 518,322 | 1,149,918 | 721,414 | 534,055 |
| Feb. | 474,723 | 1,133,724 | 676,315 | 583,137 |
| Mar. | 572,199 | 1,414,399 | 783,552 | 668,056 |
| April | 501,972 | 1,343,644 | 979,907 | 591,728 |
| 4 mo. | 2,067,216 | 5,041,685 | 3,161,188 | 2,376,976 |
| May | | 1,304,039 | 984,097 | 598,915 |
| June | | 1,268,550 | 886,065 | 578,108 |
| July | | 1,186,752 | 950,851 | 547,794 |
| Aug. | | 1,107,858 | 923,703 | 624,497 |
| Sept. | | 1,047,962 | 961,803 | 614,933 |
| Oct. | | 792,310 | 1,007,417 | 686,741 |
| Nov. | | 587,241 | 882,643 | 681,830 |
| Dec. | | 489,070 | 1,067,365 | 661,515 |
| Y'rly adj. | | | †40,859 | †23,750 |
| Total | | 12,825,467 | 10,784,273 | 7,347,549 |

†Deduction.

## Nonferrous Metals

**New York**—A general tapering in demand for nonferrous metals here coupled with light buying and barely steady prices in London created an uncertain price tone in the domestic markets last week, copper and lead held unchanged while zinc declined $3 per ton.

**Copper**—Export copper touched a new low for the week on Friday at 9.55c, c.i.f. European ports. Foreign demand was lighter on the absence especially of Japanese buying. Independent fabricators here bought occasional carlots but the bulk of business was done with company-owned fabricators. Electrolytic held at 10.00c, Connecticut.

**Lead**—The volume of trading was fair on some days and light on others with the week's total falling below that of the previous like period. Prices held at 4.50c, New York, and 4.35c, East St. Louis.

**Zinc**—Due to continued light demand sellers lowered prices 15 points on Tuesday to the basis of 4.00c, East St. Louis, for prime western. Sellers limited bookings for June and July delivery but sold

spot metal freely. Sentiment was aided by the third successive one-point increase in the galvanized sheet output rate to 39 per cent, the highest since last November.

**Tin**—All interests were reluctant to make further commitments until the result of the Malayan referendum on the proposed buffer pool is known. Prices fluctuated from around 37.85c to 38.25c.

# Equipment

**Detroit**—Ford is holding up almost everything in connection with expansion program at the Rouge plant. It is understood all equipment for tractor production has been canceled, as well as presses and other machinery for the new body plant. Ford also is reported to have held up the new foundry addition and all equipment going into this new 8-acre expansion to the present foundry, which was to have undertaken production of centrifugally cast parts on a broadened scale.

A change in crankshaft casting methods has resulted in an appreciable saving at Ford, the shaft now being cast in green sand molds instead of the sectional molds previously used. New hydraulic molding machines are used in the revised process.

Plans for the meeting of the Associated Machine Tool Dealers at Dearborn Inn May 23 and 24 are being completed; about 250 are expected. Highlight of the program will be an address by W. J. Cameron of Ford on the labor-creating advantages of new machinery.

Encouraging is reopening of all plants of International Harvester Co., May 15 on a five-day week schedule. A large volume of implement repair work is on hand, and the company's statistical department is reported to have predicted an important wave of new implement buying in the offing. This reopening will call for some purchases of new machinery for the various units of this company, spread throughout the middle west. There is also some speculation that International plans may have been spurred by government contracts. Considerable secrecy naturally surrounds government armament programs now in process, but it is the belief there is more of this work being awarded than many appreciate.

**Cleveland** — Machine tool and equipment business continues generally dull. Orders and inquiries so far in May are at about the same rate as in April, and are mostly for repair and replacement. Refrigerator manufacturers recently have purchased a considerable amount of machinery and aircraft manufacturers are ordering fairly steadily. Demand from the automotive trade, however, is disappointing, and some trade interests believe there will be considerably less demand from this source than was anticipated a few weeks ago.

**Chicago**—Occasional betterment is noted in machinery and equipment sales despite continued quietness in total business. Machine tool sales in April were about the same as in March, but some sellers report definite improvement thus far in May. Orders are small individually but more numerous. Inquiries are lighter and although pending business is fairly heavy, a portion of it represents proposed buying that has been postponed indefinitely. Small tool sales are spotty and less active than was true earlier. Railroad inquiries for major machinery are appearing only infrequently. Steel plants also are buying sparingly, expenditures for both equipment and equipment repairs being described as more restricted than during the last period of depressed operations. Plant extensions have been held up in some instances.

**New York**—Orders for machinery are few. With many metalworking industries operating as low as 25 and 30 per cent of capacity, little interest is shown in new equipment and considerable inquiry figured earlier has been held up. Domestic backlogs are well worked off, a few heavier lines of equipment excluded. Builders of heavier machinery however, are not taking many new orders, but are active on finishing old volume. Shops building engines and other equipment for the airplane industry are much busier than the average, but most of these plants are well equipped for capacity schedules, although a few individual tools are being placed from time to time.

**Boston**—Machine shop operations are tapering in spots as domestic backlogs are about cleaned up. Current operations are now dependent on spotty and scattered incoming orders and some builders are now manufacturing standard types for stock. Some shops still have large export shipments to complete. One large shop, producing a varied line of metalworking machinery, is now going 30 hours a week. Airplane engine builders and others dependent on the aircraft industry are active and generally near full time. They are also buying some equipment. Makers of packaging machinery have also experienced an encouraging upturn in orders and inquiry.

**Seattle** — Automotive equipment, road machinery and other items for public works are in best demand. Electrical equipment and mining machinery also are active. Private industrial buying is light, the canning, both salmon and fruit and vegetable, industry being handicapped by labor disputes. Logging and lumbering are making few replacements. University of Washington has called bids June 1 for coal conveyor equipment.


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# Construction and Enterprise

### New York

NEW YORK—R. C. Stanhope Inc., 101 West Thirty-first street, dealer, plans buying centrifugal pump, 8 or 10 inches, with motor directly connected, to deliver 3000 gallons per minute against 300-foot head or 3500 gallons per minute against 250-foot head; motor to be 3 phase, 60 cycle, 2200-volt and equipped with starting equipment.

NEW YORK—Seaboard Steel Products Corp., Manhattan building, has been incorporated; Samuel J. Singer, 220 Broadway; capital $40,000.

NEW YORK—Karnes Renting Corp. has been incorporated with 200 shares no par value; will handle cranes, shovels and machines; Drazen & Drazen, 152 West Forty-second street, correspondents.

### Michigan

DETROIT — Wayne Machinery Products Inc., 13941 Woodrow Wilson avenue, has been incorporated; manufacturing; John E. Lefever, 13938 Warren avenue.

DETROIT—Superior Metal-Wood Products Corp., Transportation building, has been incorporated; wood and metal manufacturing; John G. Gunner, 3572 West 126th street, Cleveland; 50,000 shares no par value.

### Illinois

CHICAGO—Walter Wellman Mfg. Co., 134 North LaSalle street, has been incorporated; 30,000 shares par value; common at $1 per share; incorporators: W. C. Wellman, A. Walter, J. E. Johnson: to manufacture, purchase, lease or otherwise acquire machinery or devices of iron. Correspondent: Walter C. Wellman, Wellman & Wellman, 134 LaSalle street.

ROXANA, ILL.—Fire destroyed the compounding plant, refinery of Shell Petroleum Corp.; loss estimated at $75,000.

### Indiana

KENDALLVILLE, IND. — Kendallville Foundry Co., organized 20 years ago, has been placed under management of Maurice Shulze and reorganized under the name of Kendallville Foundry Inc. Additional machinery will be installed.

### Maryland

CHESAPEAKE CITY, MD.—City, J. A. Kirk, mayor. J. B. McCrary Engineering Corp., Marietta building, Atlanta, Ga., engineer, receives bids May 24 for construction of water works system; $39,000 available.

FEDERALSBURG, MD.—Fire damaged James Wheatley's canning plant near here.

### Alabama

BIRMINGHAM, ALA.—F. L. Kendig, 913 South Thirty-eighth street, dealer, plans to buy an electric generator 200 kilovolt ampere, 220 volt 3-phase 60 cycle, direct connected to steam engine; sand and gravel pump belt drive, 6 or 8 inches, and electric crawler crane, 1-yard clamshell.

BIRMINGHAM, ALA.—W. M. Smith & Co., Forty-fifth street, dealer, plans to buy cable way, 10 or 15 ton capacity, used telescope, 4 inches or larger, Bliss punch press, 19 or 20 inches.

BIRMINGHAM, ALA.—Tennessee Coal, Iron & Railroad Co. will install equipment at cost of $200,000 in Docena coal mine; will include 600 steel mine cars, scale and rotary pump.

GADSDEN, ALA.—City has filed tentative application with PWA for a $500,000 project to improve and expand water works system, including new reservoir, additional mains and improvements to filtration plant; J. H. Meigham, city commissioner.

TUSCALOOSA, ALA. — Fire damaged the foundry of Strickland Machine Shop.

### Kentucky

LEXINGTON, KY. — City, E. Reed Wilson, mayor, will make application to PWA for grant of $1,613,455 for constructing water works system; estimated cost $3,585,455.

LOUISVILLE, KY.—Tube Turns Inc. has permit for $25,000, brick, steel and concrete machine shop, on South Twenty-eighth street.

### Florida

SARASOTA, FLA.—City, Herman Kimbrough, mayor, plans improvements to water softening plant.

### Georgia

ATLANTA, GA.—William E. Dunn, Peachtree Arcade, dealer, plans to buy cast iron pipe 50,000 feet, class B or equal, bell and spigot, 4 to 12 inches.

ATLANTA, GA.—Atlantic Engineering Co., 185 Seventeenth street, plans to buy generator 312 to 375 kilovolt amperes, 80 per cent power factor, 3-phase 60-cycle, 2300 volts, 900 revolutions per minute, two bearings for direct coupling, with damper windings on field pole piece; with switchboard and voltage regulator.

HAPEVILLE, GA.—City, J. R. Cathy, mayor, approved appropriation of $7000, city's share in construction of proposed $300,000 sewage disposal plant to serve Hapeville, College Park and unincorporated Egan Park section; construction to begin in a month.

MILLEN, GA.—Millen Lumber Co., W. A. Wasden, owner, plans rebuilding burned mill.

### Mississippi

ABERDEEN, MISS.—Federal Compress & Warehouse Co., 81 Monroe street, Memphis, Tenn., will rebuild Aberdeen compress at cost of $75,000; storage facilities for 15,000 bales; 100,000-gallon tank will be used to store water for fire purposes.

CLARKSVILLE, MISS.—Robert Vincent, has permit to build abattoir and meat packing plant on Fourth street.

COLUMBUS, MISS. — County Electric Power association, B. S. Robinson, superintending engineer, receives bids May 24 for furnishing material required for constructing electric lines in Lowndes, Clay, Noxubee and Oktiboeha counties.

### North Carolina

BREVARD, N. C.—Ecusta Paper Corp., 345 West Fortieth street, New York, announces company is planning to erect $2,000,000 plant on west bank of Davidson river, for manufacturing of French cigarette paper; purchased 225 acres of land; surveys being made; J. E. Sirrine & Co., 215 South Main street, Greenville, S. C., engineers.

HIGH POINT, N. C.—Board of commissioners of sanitary district, George B. Craven, chairman, will vote in 30 days on bonds to finance portion of proposed $171,000 Archdale-Trinity water and sewer system; J. Allen Austin, attorney; Geddie Strickland, 712 Montlieu street, engineer.

NEWTON, N. C.—City, Edward Haupt, mayor, considering possibility of installing generating system for electric current.

WEST JEFFERSON, N. C.—John A. Weaver plans to buy a steel water wheel of the over-shot type.

### South Carolina

MYRTLE BEACH, S. C.—Newly incorporated town contemplates $250,000 sewer system and disposal plant; W. L. Harrelson, mayor, and J. B. McCrary Co., authorized to prepare and file application with federal agencies for aid in construction of project.

### Tennessee

MEMPHIS, TENN.—Forest Hill Dairy, 2040 Madison, expending $45,000 to remodel and equip plant; installing modern machinery for handling milk; glass brick partitions; tile floors; two new type bottle washing machines; E. O. Korsmo Construction Co., Porter building, has general contract.

### Louisiana

NEW ORLEANS—Department of commerce, division of purchase and sales, Washington, opens bids May 23 for construction of radio facility buildings at Lake Charles.

### West Virginia

HUNTINGTON, W. VA.—U. S. engineer office receives bids May 24 for furnishing and delivering river wall valves, complete, for U. S. lock No. 22, Ohio river.

### Virginia

FRANKLIN, VA.—Camp Mfg. Co. plans to buy a boiler to be used with 200 to 300 horsepower, 200 pounds pressure.

### Missouri

CHILLICOTHE, MO.—Board of public works, John R. Taylor, chairman, is taking bids to May 17, 10 a. m., on construction of a power plant addition, including boiler and switchboard. Henrici-Lowry Engineering Co., 114 West Tenth street, building, Kansas City, Mo., consulting engineer.

KANSAS CITY, MO.—Clay county, Neal O. Reyburn, will complete plans about May 15 for construction of a complete sewer system and sewage disposal plant to serve about 400 customers; cost $22,000; Henrici-Lowry Engineering Co., 114 West Tenth street building, consulting engineer.

LA PLATA, MO.—City, M. E. Young, mayor, will set a date soon for taking bids on construction of a power plant and distribution system to cost $100,000; E. T. Archer & Co., 609 New England building, Kansas City, Mo., consulting engineers.

PARKVILLE, MO.—Platte County Co., E. C. Thompson, is preparing preliminary plans for construction of a 200,000-gallon per day filter plant and distribution system to cost about $150,000. Henrici-Lowry Engineering Co., 114 West Tenth street building, Kansas City, Mo., consulting engineers.

TIPTON, MO.—Southwest rural electric co-operative, H. N. Seymoure, presi-

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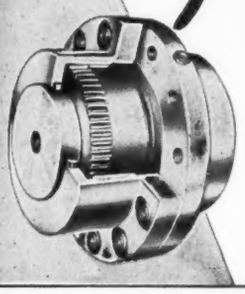

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dent, is taking bids to May 17, 10 a. m., for construction of 156 miles rural electric lines in alternate of copper or aluminum wire at cost of about $150,000; E. T. Archer & Co., 609 New England building, Kansas City, Mo., consulting engineers.

### Arkansas

PARAGOULD, ARK.—City has let contract at $133,428 to R. H. Bouligny Inc., 433 West Morehead street, Charlotte, N. C., for 3 units of proposed light plant; has PWA loan of $100,000 and grant of $90,000; project includes waterworks building, furnishing generating equipment and distributing system.

### Oklahoma

CALVIN, OKLA.—City plans construction of $15,000 sanitary sewage system.

### Minnesota

BRAINERD, MINN.—City, Walter Fall, city clerk, is taking bids to May 23, 8 p. m., on general plant construction for sewage disposal plant; mechanical equipment including sewage screen, lift pumps and motors, sewage meter, clarifier mechanisms, chlorination equipment, digesters and miscellaneous equipment; electrical cable and conduit. Burlingame, Hitchcock & Estabrook Inc., Minneapolis, engineers.

DULUTH, MINN.—U. S. department of agriculture, farm security administration, Washington, is taking bids to May 18, 2 p. m., on construction of a sewage disposal system and well at Duluth homesteads project.

KENSINGTON, MINN.—Village, A. L. Osterberg, clerk, is preparing plans for construction of waterworks including 9000 feet cast iron pipe, tower and tank, well, pump house, hydrants, valves and castings. Ealy G. Briggs, 1955 University avenue, St. Paul, is consulting engineer.

MURDOCK, MINN.—Village, A. E. Peterson, clerk, is preparing detailed plans for construction of a complete sewage treatment plant, settling tanks, biological filters, separate sludge digestion, secondary clarification and chlorination at cost of $25,000; Ealy G. Briggs, 1957 University avenue, St. Paul, consulting engineer.

### Texas

CORPUS CHRISTI, TEX.—City, A. C. McCaughan, mayor, starts work in June on gas distribution system improvements; has WPA grant of $21,000.

HEMPSTEAD, TEX.—City, J. C. Calhoun, secretary, plans construction of $66,000 water works system, pumping unit and tank; J. Rady, engineer, Majestic building, Fort Worth, Tex.

HOUSTON, TEX.—Sartartia Plantation Dairy, east of sugarland is receiving bids for remodeling dairy; to install cold storage vault boiler and other equipment; Henry S. Hoffman, architect, 3908 Main street.

HOUSTON, TEX.—Gulf Brewing Co., 5301 Polk street, St. John Garwood, attorney, presented engineering plans to city council for a $50,000 plant designed to treat industrial waste of the company that flows into County Club bayou.

HOUSTON, TEX.—Continental Supply Co., Continental building, Dallas, has plans prepared for $1,000,000 plant; has 10 acre site on Buffalo bayou off Navigation; company is subsidiary of Youngstown Sheet & Tube Co., Stambaugh building, Youngstown, O.

HOUSTON, TEX.—Cedar Bayou school district, Sam Y. Sjolander, president, board of trustees, plans erection of combination gymnasium and auditorium for Cedar Bayou high school; $20,000 bonds proposed; present auditorium to be remodeled for study hall, classroom; enlarged space for science laboratory and administration offices; new unit will contain vocational shop room.

RAYMONDVILLE, TEX.—Willacy County Water Control & Improvement district No. 1, W. E. Anderson, district engineer, receives bids May 28 for irrigation distribution system, earth work, concrete pipe work; reinforcement and construction; $168,000 available.

### Kansas

DELPHOS, KANS.—City, J. R. Manual, mayor, is completing plans for construction of a sewer system and sewage disposal plant to cost $60,000; bond issue to finance carried; Paulette & Wilson, 511 Farmers Union building, Salina, consulting engineers.

PLAINVILLE, KANS.—City, Harley Bland, city engineer, is completing plans for construction of a sewage disposal plant costing $28,000. WPA labor will be used. Paulette & Wilson, 511 Farmers Union building, Salina, consulting engineers.

RUSSELL, KANS.—City, F. J. Branson, mayor, is completing plans for sewage disposal plant costing $60,000, and will probably take bids about June 1. Paulette & Wilson, 511 Farmers Union building, Salina, consulting engineers.

### North Dakota

LA MOURE, N. D.—A membership drive is being made to organize a rural cooperative to construct 200 miles rural transmission lines in Barnes, LaMoore, Ranson and Sargen counties to serve about 1000 customers. W. A. Plath, county agent.

### Nebraska

COLUMBUS, NEBR.—City, Joseph F. Stanzel, city clerk, has appointed Robert Fulton, 2327 South Nineteenth street, Lincoln, consulting engineer to prepare plans and determine cost of construction of a municipal power system.

FAIRMONT, NEBR.—City is preparing plans for the construction of a sewer system and sewage disposal plant. Scott & Scott, Bankers Life building, Lincoln, consulting engineers.

LINCOLN, NEBR.—REA has approved an allotment of $150,000 to Lancaster county rural public power district, O. R. Toman, chief engineer and general manager, to finance construction of 143 miles rural transmission lines in Otoe and Lancaster counties. Midwestern Engineering Co., 326 Union State Bank building, Omaha, consulting engineer.

SHICKLEY, NEBR.—City is preparing preliminary plans for construction of a waterworks plant and system. Scott & Scott, Bankers Life building, Lincoln, consulting engineers.

### Iowa

CEDAR FALLS, IOWA—City, I. A. McNabb, mayor, has been granted a franchise by Grundy county board of supervisors to construct 18.2 miles of electric power line in Fairfield and Beaver townships.

COUNCIL BLUFFS, IOWA—Union Pacific railroad, Fifteenth and Dodge streets, Omaha, is preparing plans for construction of a railway mail terminal, steel and reinforced concrete, 1 story, 132 x 160 feet, steel roofing; cost $200,000. Work will start as soon as temporary structure is completed.

NEVADA, IOWA—Iowa Electric Light & Power Co., Cedar Rapids, has received permission from the Iowa commerce commission to construct 210 miles of rural transmission lines in Story county.

WATERLOO, IOWA — City, Knapp Mathews, city clerk, is taking bids to May 23, 5 p. m., on laying 3500 feet underground moisture-resisting high voltage cable, 5000 volt weight.

### Colorado

DENVER—U. S. department of interior, bureau of reclamation, is taking bids to May 31 on four 10,000-kilovolt-ampere transformers, one 115,000-volt circuit breaker, three 115,000-volt disconnecting switches, one 115,000-volt lightning arrester, and one 34,500-volt air break switch for installation at Seminole power plant; four 5000-kilovolt-ampere transformers, one 115,000-volt circuit breaker, three 115,000-volt disconnecting switches, and one 115,000-volt lightning arrester, at Greeley substation; four 2500-kilovolt-ampere transformers, three 115,000-volt circuit breakers, ten 115,000-volt disconnecting switches and one 115,000-volt lightning arrester at Cheyenne substation; one 34,500-volt air break switch for Rawlins substation.

### Pacific Coast

KLAMATH FALLS, OREG. — Ochoco Lumber Co. proposes to build a $100,000 sawmill to be completed by Aug. 15; plans by F. Hill Hunter.

PORTLAND, OREG.—Hancock Oil Co. has purchased an 8-acre tract at St. Johns, and proposes to build a $100,000 deep water terminal and distributing plant; H. F. Morrison, district manager.

BELLINGHAM, WASH. — Wash-Noble Mining Co., 936 Twenty-fourth avenue; capital $20,000, has been incorporated by E. J. Noble and associates.

ELMA, WASH.—Frosted Food Co. is considering construction of a $100,000 vegetable freezing plant.

MT. VERNON, WASH.—City plans employment of engineers to survey for sewage disposal plant.

SEATTLE—Puget Sound Pipe Supply Co., 328 First avenue, has purchased an additional site of 35,000 square feet for future expansion.

SEATTLE—Ophir Consolidated Mining and Milling Corp., 728 Second avenue, has been formed by E. B. MacLeod and associates; capital $15,000.

SEATTLE—Mayor, Arthur B. Langlie, has been authorized by city council to apply to RFC for $10,500,000 to rehabilitate municipal street car system; city has representative in the East seeking private funds.

SEATTLE—City light department has awarded contract to Fritz Ziebarth, Long Beach, Calif., for stringing a power transmission line from Skagit project to the south substation; job involves stringing 700 miles of wire on a 116-mile project.

WENATCHEE, WASH.—City has applied for WPA loan and grant to finance proposed $105,000 sewer project, also water system improvements; cost $75,000.

YAKIMA, WASH.—U. S. Grant Mining Co., capital $99,000, has been incorporated by E. J. Barnes and associates, Ward building.